COMPUTERWORLD

CLIENT/SERVER

JOURNAL

WHERE DISTRIBUTED COMPUTING MEETS BUSINESS OBJECTIVES

ROI REVISITED

HARD MEASUREMENTS MAY MASK BUSINESS VALUE

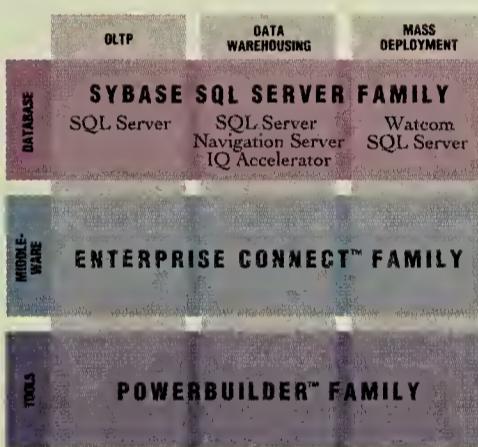# Most companies give you one type of database. Which is great if you only have one type of user.

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CONTENTS

OCTOBER 1995

Editor's Note

Client/server's gotten a bad rap over the past year. "Where's the scalable, life-blood applications?" some critics have asked. More important, where's the productivity payback? Or more bluntly, where's the return on investment?

Well . . . there's a few ways to answer those questions.

First, it's still early in the game. True client/server applications have been around only since the turn of the decade. How many years have gone by with minimal payback from centralized computing? Perhaps 30 years or so, from corporate America's perspective. Are organizations more productive? Not necessarily, if the lack of affirming documentation is used as a gauge.

Sure, client/server's start-up costs were higher than expected: Building infrastructure is often more expensive than estimates. And IS and end-user training costs have been astronomical.

Without question, vendors and some IS executives have oversold the ease with which client/server systems can be built, deployed and managed. The technology, while improving, is not as mature as we'd all like.

But maybe we're looking for returns in the wrong places. It's no longer an exercise in adding up glass house expenditures and looking for IS-related cost reductions.

As our cover story points out ("The New Value Brokers, page 28"), client/server systems help distribute both information and technology assets across the enterprise. The end result is more flexible systems that generate greater value, such as streamlined processes, which can translate into lower sales costs, higher profits, improved customer service and retention, and faster time to market.

Case in point is Kansas City Power & Light, which recently completed a multimillion-dollar migration to distributed computing without an ROI study. "We invested in client/server because it was a necessary ingredient to our business strategy," said Doug Morgan, vice president of technical services.

But value creation may not wash with the executive suite, which always needs mathematical models to justify how corporate dollars are spent. So, how about looking at client/server expenditures as part of a return-on-assets calculation? Or as a way to build intellectual capital?

In this way, at least, client/server would be viewed as part of the net worth of an organization. These systems are a key part of the infrastructure. They'll create value — or sustainable, competitive advantage — only if they receive care and feeding. They'll receive that nurturing only if we stop looking purely for the bang they provide for the buck.
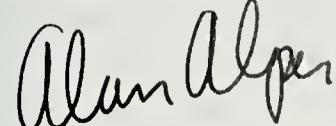
INTERNET: alan_alper@cw.com

Alan Alper

ALAN ALPER

Client/Server Journal's ROI is measured in the value we provide to you. That means publishing detailed client/server information and insight you can't get anywhere else.

That's why, with this issue, we begin a regular section (see Extended Enterprise: Sales Force Automation, page 42) that will probe the depths of the extended enterprise — the challenges of conducting business electronically with your suppliers and customers as well as overcoming the obstacles that prevent road warriors from working as effectively as they can.

This is but one of many changes we plan for the coming year (check out our new logo on the cover). Stay tuned.

Letters

REGARDING "WHICH WAY, NO-vell?" in the August 1995 issue of *Client/Server Journal*, I think Novell must also consider its stance on customer service, or should I say lack thereof. Charging customers for manuals or for technical support after they purchase a $4,000 software product should not be tolerated.

When we add new servers or networks, they will be Microsoft Windows NT-based. This is simply because it's cheaper, and there is a technical support system available that doesn't cost us $100 an hour. My advice for anyone faced with choosing between the two: Come on over to Windows NT. Novell can only gouge the industry if we allow it.

DAVID ZINK
Network administrator
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I LIKED THE MOST RECENT EDItion of *Client/Server Journal* so much I felt compelled to say something because we all hate to work in a vacuum. I struggle, on an almost daily basis, to explain various aspects of our client/server architecture to all kinds of interested parties within our company. I now have a very readable tool to help provide the necessary context for these explanations. Your journals have been an indispensable aid in fleshing out the wire-frame architecture that we use among the technical group, which has failed miserably beyond the aforementioned handful of technical types who use it daily to pursue their work.

I go to all this trouble of explaining how I use your journal and its information because not all of its val-

ue is realized the moment I read it. I am constantly dredging up these journals.

So I didn't want to just fill out your faxback form, which would not have reflected the true value of the publication. Remember, no system will succeed unless the target organization understands and then accepts just what in the hell it is getting. So explaining these concepts is a crucial activity that needs to be done well, with enthusiasm and with empathy to ensure that the full benefit of these new systems can and will be realized.

DAVID G. MCDONALD
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YOUR PIECE ON THE CENTRALization of client/server by Avery Jenkins in the August issue of *Client/Server Journal* ("Centralization Strikes Again") had an interesting slant on the whole client/server deployment issue.

For years, the client/server model has been touted as the ultimate solution for controlling IS budgets, staffing problems, rapid deployment of software solutions and heartburn. Great model. Everyone gets a computer, and everyone's computer gets to work together. Low startup costs. Eliminate the costly mainframe. Easier and more powerful development tools.

Linking the PCs and their productivity-enhancing software is a step in the right direction. Need more "thru-put"? Link up another server! Incremental growth as needed. Each upgrade is relatively inexpensive.
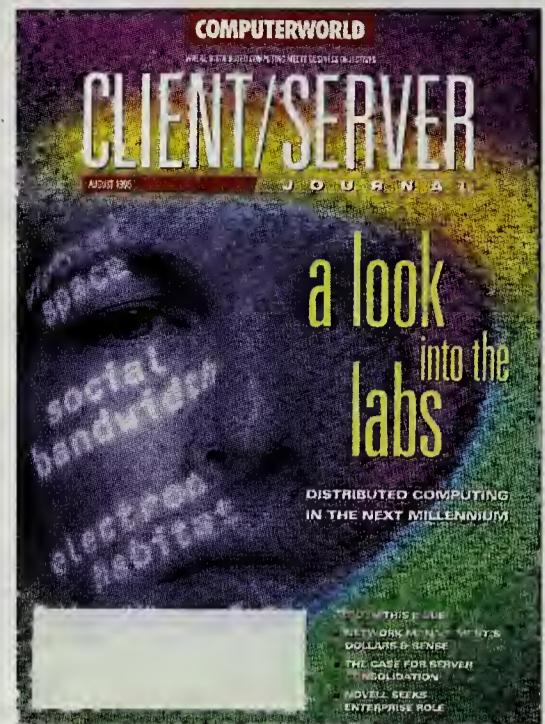
Sounds great. But on the downside, all this flexibility comes at a price.

The price is the inherent complexity in hardware design, network topology, communications protocols, LAN operating systems and data synchronization issues that had to be addressed when the basic "mainframe model" was broken up into pieces. Don't get me wrong — I like the model. Well, most of it. The part about incremental growth via "another file server" makes me cringe.

Whether the file servers are dispersed throughout an organization so you can see them or they are all in one room, you will end up with a "bunch." Each requires "care and feeding." Sounds like multiple points of failure (hardware, software, backups, spilt coffee, etc.) to me.

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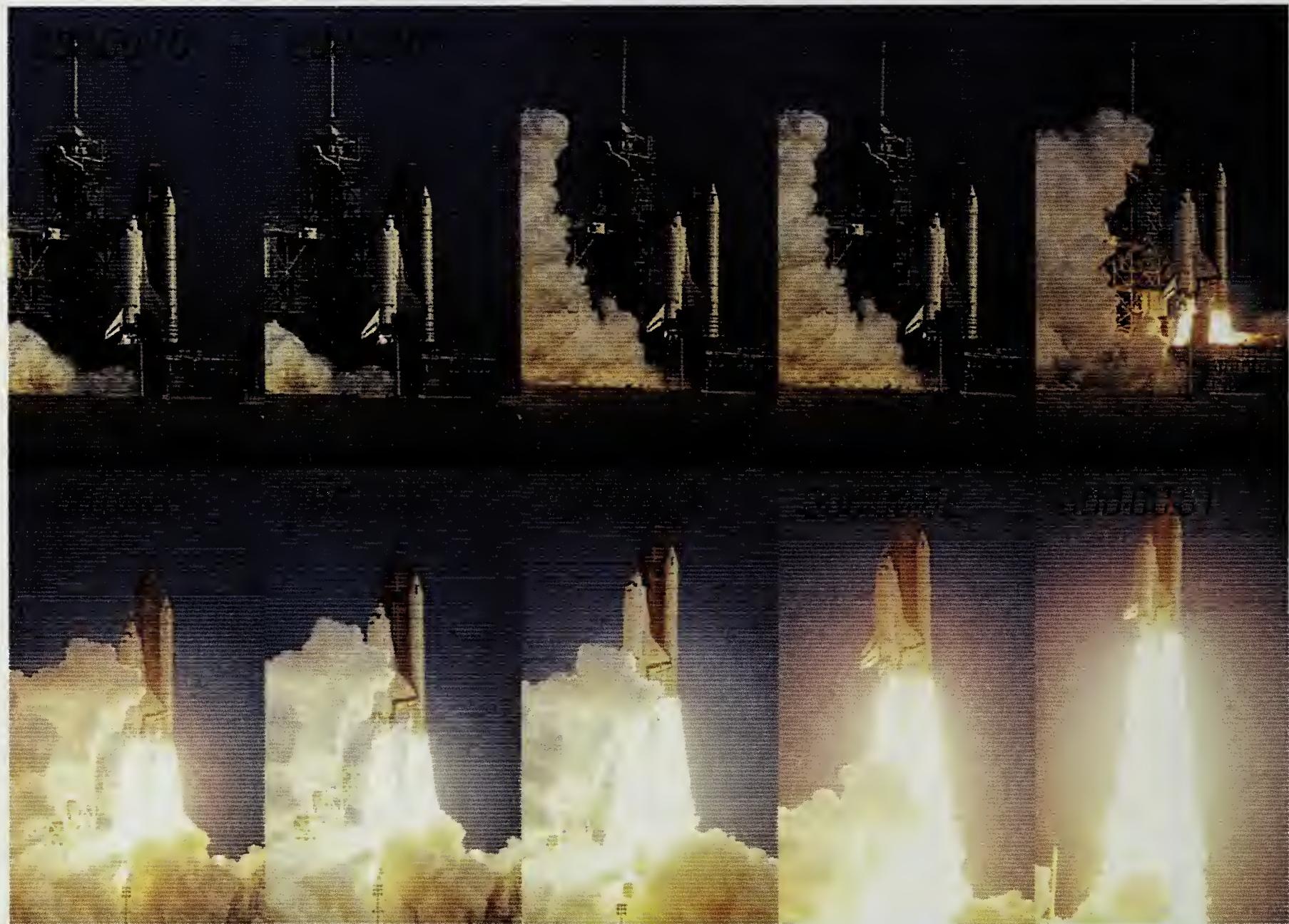
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INSIGHTS

CNBC Sees Red

Cable TV affiliate finds itself caught between NT and Windows 95

CNBC's Jeff Greenberg: 'Everyone is leaning toward having client of choice on the desktop, and Microsoft is not helping us'

It's analogous to having a television set that receives only one channel. That's the tight spot in which CNBC, the cable TV arm of the National Broadcasting Co., finds itself.

The news/talk cable outlet is building a distributed environment that will permit any of its 200 PCs to access a mix of custom-built and packaged applications on Windows NT and MVS servers.

But a funny thing happened on the way to open, client/server nirvana.

An alliance between NBC and Microsoft Corp. committed CNBC to delivering its financial news exclusively to Microsoft Network (MSN),

which displaced Prodigy as CNBC's on-line partner.

Problem is, there's only one way for everyone to access MSN: via Windows 95.

Though not a major deal, it's become a matter of principle for the Fort Lee, N.J., broadcaster. Roughly 25 PCs will have to be outfitted with Windows 95 for CNBC to meet its end of the alliance. The shame is that many of those desktops require the stability of 32-bit Windows NT, said Jeff Greenberg, CNBC's director of broadcast and information systems.

Microsoft acknowledged that many of its customers would like to access MSN

from NT, but so far the vendor has declined to commit to providing those hooks.

Some industry observers say Microsoft is just being coy. "My observation is that they've not made a commitment on NT because they want to stuff the pipeline with Windows 95," noted George Roukas, a vice president at New York consultancy The Windows Support Group.

Others contend that MSN support will come with the next release of NT, expected next spring. "NT will get a new shell [the Windows 95 graphical user interface] and MSN but will not get [Windows 95's] plug and play because that's very complicated," said Jesse Berst, editor of "Windows Watcher" in Redmond, Wash.

Greenberg, who's been testing NT with the Windows 95 interface, said, "It's the best of both worlds. If MSN were available on NT, I would deploy NT everywhere."

But CNBC is persevering. It plans to leverage MSN in some very creative ways. One near-term option is to enable viewers to send their investment portfolios via MSN to CNBC for discussion during financial broadcasts. ∎
—*Alan Alper*

on location

MIT Appoints Staff Hiring System

University TAPs into workflow concept

MIT — that bastion of world-class higher education — places a premium on its faculty. And now it has a system to prove it.

The Appointment Process (TAP) is intended to eliminate the Cambridge, Mass., school's antiquated, paper-laden process for hiring, firing, promoting and transferring faculty and personnel. It is the result of one of the school's six business process re-engineering initiatives. Its goal: to define one standardized process for an appointment method that was up until now a nightmare.

The former process generated a six-part Faculty and Academic Staff Appointment Form that went off to different MIT departments, such as payroll and personnel. The form then spawned such things as benefits, parking permits and office space.

However, once the form was generated, there was no system to track its travels among departments. As such, an appointment could take four to six weeks — if the paperwork didn't get lost — and even then, new faculty could show up to find they didn't have an office or were not on the payroll. "With TAP, the process now takes one week because everything is electronic and in one place," said Steve Scarano, assistant to the vice president for information systems at MIT.

TAP is based on a checklist workflow concept in which work happens incrementally over steps and time. For example, Scarano said, when MIT is ready to hire someone, each piece of information in the requisition, recruitment and hiring processes is captured until there is a complete transaction.

Powersoft Corp. PowerBuilder-built TAP runs on Intel Corp.-based PCs running Windows or on Macintoshes over a TCP/IP network. Pending information about a particular appointment is stored in an Oracle Corp. relational database running on a Digital Equipment Corp. Alpha server. The system will use Oracle Secure Network Services for authentication and encryption of sensitive personnel information.

TAP is expected to reduce the error rate from approximately 40% on some appointment transactions to 0% as well as eliminate shadow systems, Scarano said.

TAP was designed by a team comprised of consultants from Cambridge, Mass.-based Bremer Associates, Inc. and MIT personnel, with Rambyte Consulting Co. in Framingham, Mass., heading up software development. Using evolutionary software development and iterative prototyping, which requires extensive user feedback each step of the way, the team was able to deliver a working system in six weeks.

"This is the quickest way to get an application that looks right and feels right to the business user," Scarano said.

For example, by optimizing PowerBuilder, the team was able to change 21 things on TAP, such as adding fields and changing the tags that describe a field, in one day.

TAP has been running as a pilot with the personnel administrator at MIT's Sloan School of Management since June. It has been in a limited rollout to the rest of MIT's schools since September. And Scarano envisions putting TAP to work for all those who interact with MIT, such as employee spouses and food service contractors.

Eventually, Scarano said, he would like to see TAP ease life at MIT for these folks, too, by making it easier for them to get their parking spaces and athletic facility privileges, for example. "I see it as the point of entry to provide all services to MIT, except student services." ∎

— *Catherine McCrorey*

TAP's pull-down menus and prefill functions minimize keystrokes

ILLUSTRATIONS BY JAMES KACZMAN

PROJECT PERISCOPE

A quick glance into client/server developments at user sites nationwide

Y'ALL COME BACK NOW

If you call Embassy Suites, Hampton Inn or another Promus Hotel Corp. hotel this fall for a repeat reservation, you might wonder why the call center agent doesn't ask your name. Well, rest assured: He already knows it. Software agents are now providing human agents at the Memphis-based company with six-month histories of each caller's visits to a Promus hotel. When Promus began planning its $250,000 client/server implementation in August 1994, it chose Edify Corp.'s Electronic Workforce software agents to save its staffers keystrokes. Now the 300 call center agents simply execute a "FIND GUEST" command on their PCs using the caller's phone number, which the software agents have already stored on-screen. Running on a Compaq Computer Corp. server, the software agents use this phone number to search the Informix Software, Inc. database residing on one of two Pyramid Technology Corp. servers and then display the customer data on the staffer's PC screen. Although all four hotel chains have been up and running only since August, statistics show that call center agents save about 20 seconds on each successful call. This means Promus needs fewer staffers, and customers waste less time on the phone. And a satisfied customer won't be a stranger.

MILES TO GO BEFORE I SLEEP

The next time you drive your family to Florida, the Triptik you order from the Heathrow, Fla.-based American Automobile Association (AAA) might not look much different. But some AAA staffers will know the difference. Creating Triptiks — customized strip maps — has long been a laborious manual procedure for staffers, but an automated Triptik system can now ease the burden. Staffers just enter the traveler's data, such as trip origin, destination, stopovers and driving preferences (i.e., no toll roads), into a Windows-based PC and send it to a Sun Microsystems, Inc. SPARCstation at one of four regional production centers. The server processes the data and prints the customized, color Triptik. The system has been running at one production center since early this year, while the other three will be operational by next spring. Already, one AAA office that uses automated Triptiks has virtually eliminated backlogs and sharply reduced temporary staffers and overtime.

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on location

TIME'S NOT ON YOUR SIDE

Why aren't companies getting any payback from information technology? Pat Mullen, president of The Mullen Group in Sudbury, Mass., and former chief information officer at Digital Equipment Corp., asks that you consider the following numerals: 21, 18 and 15. Give up? Most companies, he said, are using 21st-century technology with 18th-century management philosophy and 15th-century accounting practices.
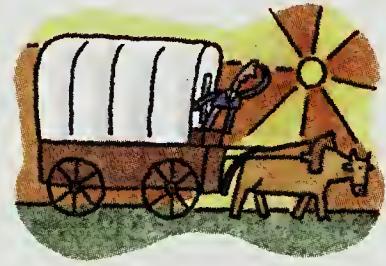
THE BANE OF PIONEERS

Brilliant insight is not what sold Regency Systems Solutions, Inc. on Unix, according to Dan Amedro, vice president of information systems at the recent Enterprise Computing Conference in Chicago. The Oak Brook Terrace, Ill., technology arm of Hyatt Corp. was one of the first commercial organizations in the early 1990s to adopt open client/server systems. "We were inches away from picking a proprietary solution, but fortunately it didn't work out in terms of price/performance," he said.

JOKE'S ON YOU

What's the difference between a used car salesman and a software salesman? The used car salesman knows he's lying.

If At First You Don't Succeed

Not every company that tries to move to client/server is immediately successful. Alert Centre, Inc., an Englewood, Colo.-based alarm monitoring company for commercial and residential properties, found that out the hard way.

Chief Information Officer John McKee requested a $2 million project budget for 1995 to migrate the company's alarm monitoring off its two fault-tolerant Unix boxes onto several high-availability, symmetrical multiprocessing IBM RS/6000s that were 75% less expensive. He also planned to put customer databases on the new servers to give employees a common platform for on-line data.

His request was denied for financial reasons.

For now, McKee has installed a couple homegrown applications: a work order tracking system and a commission system that calculates commissions as field salespeople enter data on desktop PCs. These reside on older-model IBM RS/6000s, while monitoring remains on the fault-tolerant boxes.

McKee said he still plans to buy newer high-availability RS/6000 processors next year: One could monitor the 40,000 alarm signals the firm receives daily, for example, while another could run business applications. This would require fewer staffers and enable instant employee access to customer databases. ▨

—Kimberlee A. Smith

You're on the brink.

Ready to plunge into client/server.

You've got a few butterflies.

And plenty of questions.

Fortunately, thousands have done it before.
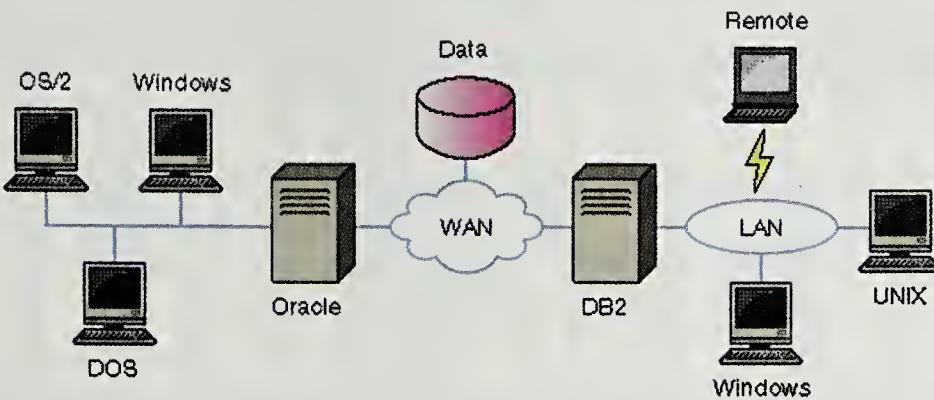
And we can show you their blueprints.

The challenges of adopting the newest technologies are well documented. Fortunately, so are the secrets of doing it successfully.

IBM has helped companies all over the world design and implement multivendor client/server systems. Systems that enable them to gain a competitive advantage, adapt to change and get closer to their customers. And we're very eager to share what we have learned.

That's not to say we can transform your company overnight. But by arming you with the right knowledge, we can definitely make the process more efficient.

We've documented the experiences of hundreds of companies in our Client/Server Advisor. It's an extensive Lotus Notes®-based library of proven solutions that demonstrates how others have solved many of the problems you face, and illuminates the potential pitfalls.

Can your computer company do this?

This resource lets you look at the challenge from every angle, to find real solutions that enhance the way your business does business.

Even better, we're prepared to dive in with you, putting knowledge into action. IBM is committed to a variety of open standards, so we can help maximize your current investments and integrate the new technology you need.

Whether it's made by IBM or anyone else. The goal is to design a system that can change and adapt as quickly as your business.

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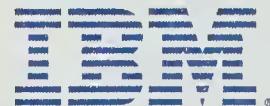
Solutions for a small planet™

Healthy, Weary and Wise

They are to health care organizations what Mars exploration is to the earthbound. Give up? The answer is electronic patient records and integrated delivery systems.

Ideally, these systems are repositories of patient data that track health histories, medications, treatments and the like — for one hospital stay and throughout a patient's life — in any facility and by any caretaker.

This complex and cost-prohibitive task is made worse by the fact that there's not a lot of help out there: "The software on the market . . . is young, immature or nonexistent," said Larry Pawola, executive vice president at Sheldon I. Dorenfest & Associates, a Chicago consultancy.

But, he said, "some organizations are willing to go through risk and pain to build it."

Lutheran Health Systems (LHS) is one of those firms. The $1 billion, not-for-profit Fargo, N.D.-based health care management firm, which operates facilities in 70 rural communities west of the Mississippi, is building a "patient/community repository." By early '96, it will track patient histories, assess risks and generate physician referrals across all facilities in a given community.

Not only is this LHS's first experience with client/server, but the firm's also using leading-edge technology: the Smalltalk object-oriented development language and an object database from Gemstone Systems, Inc.

LHS considered Oracle

Lutheran Health finds the pain of putting patient records on-line is worth the gain

Corp. and Sybase, Inc., but Gemstone dealt better with LHS's mixed data types, said Gail Miller, LHS special services director.

Plus, it's easier with object databases to make the database more "active," said Ken Lawonn, vice president of information services. For instance, blood results gathered in a home-care setting could enter the lab database, triggering a physician referral.

Relational databases could handle such triggers, he said, but in Gemstone the action, or behavior, is stored in the database itself. The resulting object, with its logical behaviors, can then be used repeatedly.

Others agree that objects fit well into the patient care setting. While the relational model is perfect for what some call the "encounter model" (an encounter being, say, a visit to the doctor), object databases could better handle the integrated delivery model,

which works outside the traditional hospital setting, said Chuck Henderson, senior manager at Andersen Consulting's health care practice in Columbus, Ohio.

"I'm real impressed [LHS] is doing [development] in objects," said David E. Garets, chief information officer at Magic Valley Regional Medical Center in Twin Falls, Idaho. But for a similar project, he plans to partner with a software provider. And though he required object-oriented development, Garets plans to use a relational database with object extensions. In addition to performance concerns with object databases, "we've got a lot of textual data to store," he said.

Still, "if it pays off for them, they're going to be years ahead of anyone else," Garets said.

No doubt, LHS has a few challenges ahead. "All the technologies are 100% new to us, down to the [Unix] operating system," Miller said. So far, no new staff has been hired, except for a contractor who is well versed in Smalltalk. Two more experienced programmers will be hired next year.

But LHS did get a head start by purchasing an information model and data model. These let LHS "go straight into detailed design rather than conceptually designing the entire repository," Miller said.

LHS expects the system to pay for itself, but it has not projected hard-dollar benefits. "We look at it in terms of reduced cost per member per year," Lawonn said. ◪

— *Mary Brandel*

BU⚡⚡WORDS

A compendium of recently generated buzzwords:

ATM: Asynchronous Transfer Mode? Nah, **Acquiescing The Money!**

CYBERSPACKLE: Another word for middleware.

MICROSOFT BACK-OFF-IT: What some hesitant users are calling the Redmond, Wash., firm's BackOffice bundle of operating system, database, groupware, connectivity and systems management software.

INFORMATION REPURPOSING: Transforming information published in one medium for use in another (i.e., moving a graphic captured on-line for use in a word processing document).

REALIGNMENT: Yet another new word for downsizing.

SIU: Semi-Intelligent User, referring to an individual's desktop system.

MUTT: A development organization consisting of individuals with different backgrounds and expertise.

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thinks Unisys
is just a computer
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UNISYS

A Better Way for Circle K

a time line to success

The "convenience" in Circle K Corp.'s convenience store business used to apply strictly to its customers. Convenient is not how the Phoenix-based chain would have described its information systems throughout the 1980s. During that time, the company's finances were strained in the wake of a major expansion to 4,700 outlets across the Sun Belt.

Chief among the problems was the lack of a coherent business plan, according to Vice President and Chief Information Officer Bill Seay. "What we had was an aggressive store-count growth plan, not a well-planned strategy for managing the growth," he says.

Making the task of planning and forecasting tougher was an IS infrastructure that virtually forced the company to rely on gut instinct rather than hard analytics.

Seay says that under the old mainframe-based system, business planners had to manually gather critical information on customer demographics, store area performance and real estate. And for operations managers running existing stores, there was no mechanism to retrieve valuable sales information from the mainframe in a timely manner, so decisions on product selection and inventory also tended to come straight from the gut.

However, with a Chapter 11 bankruptcy filing in 1990, Circle K committed itself to a more sensible business strategy based on profits rather than on growth for growth's sake.

About 2,200 stores were closed,

and a new strategic plan was unveiled. That plan takes the company into more stable growth preserves such as foreign joint ventures, licensing and franchising. It also outlines a more methodical approach to future U.S. store expansion. In addition, the strategy calls for greater operational efficiencies and new retailing innovations.

Crucial to pulling off the new plan, Seay says, is a leaner and more responsive IS organization, built around the distribution of computing resources and a new open systems philosophy. "We knew we had to get information back to the people who need it to make daily decisions, and it had to be available to them in a timely fashion," the Circle K executive says.

Last September, the new IS strategy started taking shape when Circle K signed a five-year data center outsourcing deal with Unisys Corp. That arrangement, which involved transferring 15 members of Seay's 100-member IS staff to Unisys, enabled the internal group to focus on implementing the next wave of distributed applications as well as shave large systems costs by up to 30%.

Under the deal, Unisys has moved the data center to its own new facility in Tempe, Ariz., and is responsible for the existing Unisys mainframe, as well as for operating and upgrading the IBM AS/400™-based store automation system and the IBM RS/6000-based gasoline ordering system (85% of Circle K outlets sell gas).

Since September, the Unisys/Circle K relationship has expand-

> *Crucial to pulling off the new plan was a leaner and more responsive IS organization, built around the distribution of computing resources and a new open systems philosophy.*

ed to incorporate a partnership in open systems. Unisys is assisting Circle K in procuring Unix servers and off-the-shelf software.

"Initially, Circle K was skeptical of us because they perceived us having a mainframe-only orientation," relates Kyle Bardet, the Unisys account executive. "But we've shown them we can support foreign platforms and have the skills in open systems. Right now, the best way I can characterize the relationship is 'flexible.' There is nothing that's off-the-table. Communications, like the data center itself, are open 'round-the-clock."

Bill Webb, information technology director at Circle K, concurs. "Unisys has surprised us with their depth of resources and knowledge of open systems. We're no longer a mainframe shop tied to support of a Unisys OS," he says. "All of a sudden, doors have opened to whatever kind of software can run Unix, and Unisys has helped expand those choices."

Circle K, meanwhile, has moved aggressively to buttress its own open sys-

tems skills, providing personnel with in-house classroom education and hiring more IS staffers with expertise in client/server systems and network management.

Last December, the company kicked off its first major client/server project, signing an application license with PeopleSoft, Inc. for a new Human Resources Management & Payroll System. That system has streamlined a two- to three-day manual process under which Circle K field offices used to mail in all employee data — new hires, pay raises, terminations, etc. — and receive paychecks and reports once the information had been keyed into the mainframe system.

Now, payroll data is keyed into a PC in each store and fed to headquarters, where it is automatically formatted into the PeopleSoft application running on a Unix server. The system updates the data and sends it back to the stores, where the payroll checks are cut.

The total savings in time and costs are

Strategic milestones

May '90 Circle K files for Chapter 11 bankruptcy protection

December '91 Corporate management announces new business plan of strategic consolidation that includes closing certain stores and renewing key franchises

July '93 Circle K emerges from bankruptcy and is acquired by InvestCorp., an investment company

March '95 Circle K becomes a public company again

Technology milestones

June - December '94 Circle K evaluates various off-the-shelf packages for a client/server human resources system

September '94 Company signs a five-year data center outsourcing pact with Unisys

January '95 Company begins installing hardware and software for the HR/payroll application.

November - December '95 IS plans to bring a second server into production to handle marketing and merchandising info processing

November '94 Company moves data center from its Phoenix headquarters to Unisys' service facility in Tempe, Ariz.

December '94 Circle K signs application license for PeopleSoft's Human Resources Management & Payroll software, which runs on Sequent servers

September '95 IS department plans full rollout of "Solar," the payroll portion of Circle K's HR application; the time reports application is due for a full rollout in 1996

Summer '96 Circle K plans full rollout of a third client/server system running core financial applications

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enough in themselves to justify the project, but more important is the shift in computing power, according to Christine Bernhard, director of business applications at Circle K. "This allows users access to human resources payroll and gives them the capability of generating their own reports without having to come to us," she says.

For example, if the Benefits Department wants to add a new health plan, it will be able to simply call up the appropriate screen and update it with the new information.

"Before, they had to come to us, and we had to modify all the [relevant] pieces. It took a substantial amount of our programming time to handle those types of requests," Bernhard says.

The "Solar," or payroll, application, is already deployed live at some locations and was due for full implementation last month. The "Atack," or time reports, system, which will eliminate kcying in timesheets, is now being tested and should be rolled out next year.

"If client/server is about putting computing power in the hands of users, where it belongs, then this is client/server in its purest form," Bernhard concludes.

Seay adds, "Human resources was a good place for us to cut our teeth. It's a more structured process that everybody in the company understands. Once that's up, we can move on to

> *The total savings in time and costs are enough in themselves to justify the project, but more important is the shift in computing power.*

more complex re-engineering efforts."

Late this year, Circle K plans to bring a second server into production to handle its marketing and merchandising information processing. To date, the company has had to rely on summary product data at the category level: soda, snacks and so on.

"The new system will load item-level information via electronic data interchange transmission," Seay explains. "The server will provide a warehouse of data on purchases that will give district managers what they need to maximize sales. ... This move will also establish our foundation for future point-of-sale and scanning development."

Another long-term project aims to shift all of Circle K's core financial applications to the new open systems platform that is running PeopleSoft Financials. This year, existing applications that feed into the general ledger are being converted to PeopleSoft, which should be up and running companywide on a third server by next summer, according to Seay.

Seay and his staff report no problems on the cultural front. "Our people see the real value of what we're doing," he says. "Our goal now is to keep building on that appreciation and working to focus and re-engineer our business processes." •

William Seay
*Chief Information Officer,
The Circle K Corp.*

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UNISYS

Avoid Last-Minute Disasters: Model Your Way to High Performance

Performance planning goes beyond hardware size — you need to consider application performance and functionality every step of the way

BY SHAHLA BUTLER

Most industry sources agree that 80% of client/server projects to date have had to be redesigned because no one thought about checking performance considerations from the beginning. When measurements are taken, it is usually with the intention of planning for system capacity and ensuring that the hardware is "sized" properly.

However, performance planning can and should be so much more. Ideally, it takes into account both the application's performance and its functionality and occurs throughout the design process to ensure that a system meets technical and user requirements.

A whole range of issues needs to be considered: application workload and architecture, network and hardware characteristics, user work habits and database design. The effect of each element on system performance is difficult to predict and even more complex when the nonlinear interactions of all these components are integrated in a client/server or object-based system.

For example, we recently developed a model for a call center operation integrating computer telephony, client/server and object technologies. In the process, we came across a surprising development: The bottleneck for the

system was the call box, not the server, contrary to what we had anticipated.

A sound system development methodology requires defining your performance requirements while simultaneously looking at system functionality. In the client/server environment, the most effective design is holistic, balancing the distribution of

functions to satisfy user needs with the increased magnitude of system management, software distribution and network and application performance demands.

Modeling the entire system and application workload is key to planning performance. However, simple spreadsheet models cannot adequately account for the interplay of components. A deep understanding of technology and specialized skills is a prerequisite.

Let's say we want to know

the performance of a query against a distributed database. The modeler needs to understand the database architecture, application design, design of the application's database and the way the network will handle traffic and add overhead. Not surprisingly, the modeler should have solid modeling skills, including an understanding of queu-

ing theory and statistics [CSJ, April 1995, page 30].

The modeling process is further complicated by the fact that no single tool addresses all components of a client/server system. Intermittently checking the system's performance through modeling and benchmarking techniques dramatically increases your chances of catching design flaws early, saving precious development time and money.

The main reason for modeling your system's perfor-

mance is to minimize the risk of project failure. Start by developing a high-level model that includes all the major components of the system but ignores the details of their implementation.

Suppose you want to answer a question about the network, the server power and the amount of memory on the desktop. The highest-level modeling activity would use a sophisticated but general-purpose tool and use appropriate workload characteristics for each of these components to identify the weakest link.

If network capacity turns out to be the weak link, the next level of modeling should use an appropriate tool designed for modeling the network only, accounting for the implementation details to fully characterize the network and analyze its behavior.

Modeling can be the most effective tool in a developer's arsenal for fully understanding the behavior of the system being designed. After all, going live with a strategic project should be more akin to a game of chess than roulette. ◪

Butler is associate director at the Center for Advanced Technologies at American Management Systems, an international business and information technology consulting firm headquartered in Fairfax, Va.
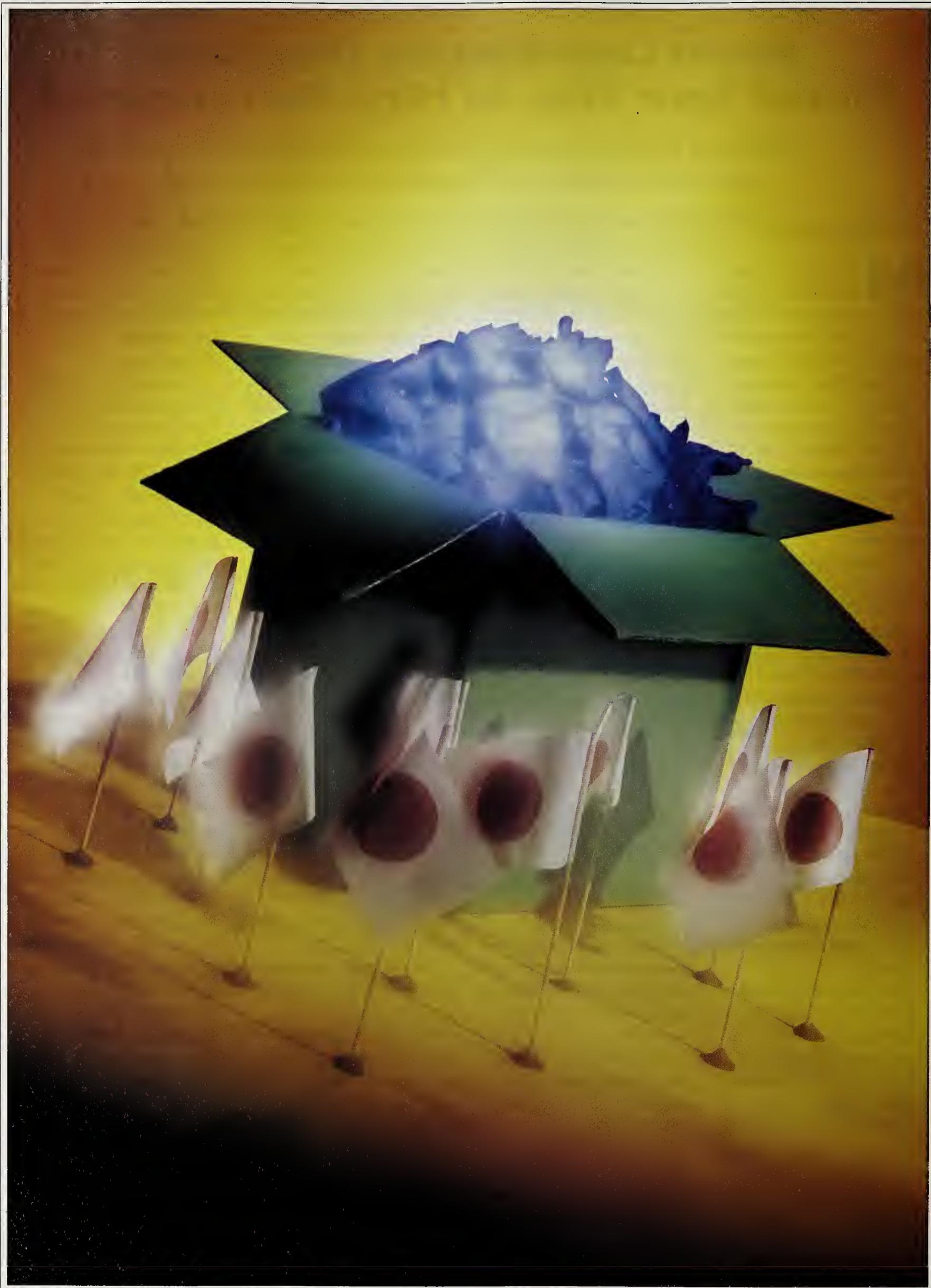
Not necessarily MADE IN JAPAN

Technological, management and cultural barriers aside, Japanese corporations are stepping gingerly into client/server.

There is a running joke among information systems managers at Nomura Securities. In 1988, the company christened its then-new $1 billion trading system "dai san ji onrine sisutemu," or "third-generation on-line system." That also translates to "big disaster on-line system."

At the time, the technology was state of the art. But for Japan's largest securities house, the 30-mainframe, 5,000-terminal system did indeed become sort of a big disaster, according to a manager in the business planning office at Nomura Research Institute Ltd., a Nomura subsidiary that handles the company's information systems.

Back in the booming '80s, the Tokyo Stock Exchange was trading 2 billion transactions a day. In 1989, volumes got so high, you could smell burning plastic coming from the back of the exchange's computers, one trader said.

But with the downturn of Japan's bubble economy and the concurrent shrinking of stock trading volume, Nomura found it needed only about half of the system's 10 million transaction-per-day capacity. The real disaster, however, was the system's roughly half-a-billion dollars a year in costs, including maintenance, power, water and amortization.

Like many other Japanese companies now recovering from past excesses, Nomura needs to dramatically slash costs. That's why it's cutting the "big disaster" system down to a shadow of its former self through a massive client/server computing-based downsizing effort.

Motivated by a need to raise the productivity of bloated sections of middle managers without U.S.-style layoffs, a rash of Japanese companies are implementing client/server architectures. For example, a survey of 700 IS executives at large and medium-size Japanese companies showed a 150% jump since 1993 in the number of companies that are moving or have moved to client/server (see chart page 20).

Meanwhile, anecdotal evidence of growing client/server fever abounds. IS managers at a large Japanese automaker once known for its IS prowess recently completed a U.S. tour to learn from successful client/server implementations. And if attendance at networking trade shows is any indication, interest in client/server is stratospheric. Tokyo's Networld/Interop '95 in July, for instance, attracted more than 70,000 attendees — a 50% increase over last year's number.

But in their efforts to evolve, the Japanese are working against some harsh realities as well as decades of ingrained thinking (see story page 22).

Japanese IS departments in general are conservative and loath to re-engineer their business processes with client/server systems unless they are losing money, said Richard Sullivan, a partner at Andersen Consulting's Japan office. "Frankly, a lot of companies can't get past the inherent con-

BY ROB GUTH

servatism unless they have a crisis, so there's a lot of denial," he noted.

To break through died-in-the-wool thinking at Dai-Ichi Kangyo Bank Ltd., IS managers started a promotion team. "Generally Japanese salespeople are very conservative in their approach and tend to reject new things," said Masahiro Yokoda, a member of the bank's planning and development group. The team is providing theoretical and philosophical training "so they can change their behavior patterns," he said.

Another complication is a conflict of interest among Japanese vendors. Though influential players such as Fujitsu Ltd. and NEC Corp. are trying to recast their mainframes as servers and promote open systems, they continue pushing the higher-margin mainframe business.

Meanwhile, customers that for generations have relied on vendors to make their IS decisions are listening, said Kazumasa Nishioka, representative managing director at Tohmatsu Touche Ross Consulting Co. in Tokyo.

BAD NEWS TRAVELS FAST
Moreover, Japanese managers have come up to speed quite quickly on the downside of client/server, thanks to peer experiences in the U.S. and Europe. News about the unexpected costs of client/server, for instance, has led to a loss of confidence in the technology, Nishioka said. A recent survey found that Japanese IS managers are unsure whether client/server will bring them cost benefits and are now hesitant to move ahead with client/server plans, he added.

All of this helps explain why many Japanese firms are just beginning their struggle with first-generation client/server systems, in which PCs and PC LANs are, for the most part, retrieving and reformatting data from centralized mainframes.

"Every time I talk to someone [in Japan], there is usually a mainframe hiding in the equation," Andersen's Sullivan said.

Mitsubishi Bank Ltd. in Tokyo, for instance, is running client/server systems at the branch level using IBM RS/6000 servers for branch PCs. But at night, the day's transactions are batch-processed by Mitsubishi's central mainframes.

In general, client/server systems in Japan usually add features, such as workgroup, inquiry, sales support systems and electronic-mail applications, to the enterprise information architecture. Production systems are rarely client/serverized, said Kyoishi Okamoto, director at market researcher Dataquest Japan K.K.

The tendency to leave legacy systems untouched is partly due to the difficulty of migrating what are often 20-year-old mainframe systems onto distributed platforms, as well as a lack of tools to do the job, he added.

Complicating the situation for

many Japanese companies is their immature PC LAN infrastructures, said David Kellar, multiuser analyst at IDC Japan Ltd. The LAN penetration rate in Japan, though growing rapidly, reached only 25.4% in 1994, while in the U.S. it is higher than 60%, he noted.

In addition, although the catchphrase "hitori/ichidai," or one person/one PC, is ubiquitous in Japan's press, most companies have yet to attain that goal: Slightly more than one in four Japanese white-collar workers are equipped with PCs, according to IDC Japan.

To be sure, some mission-critical client/server systems are popping up. Tokyo-based NTT Leasing Co., a subsidiary of domestic carrier NTT, fired up a system in April in which application logic is distributed among an AT&T Global Information Solu-

LAND OF THE RISING CLIENT... AND SERVER

Which statement best describes your site's attitude toward so-called "client/server" computing?

PERCENT OF RESPONDENTS

Legend:
- Moving or have moved
- Planning to move
- Unsure of best path
- No current plans
- Just a buzzword
- Don't know

Years: 1993, 1994, 1995
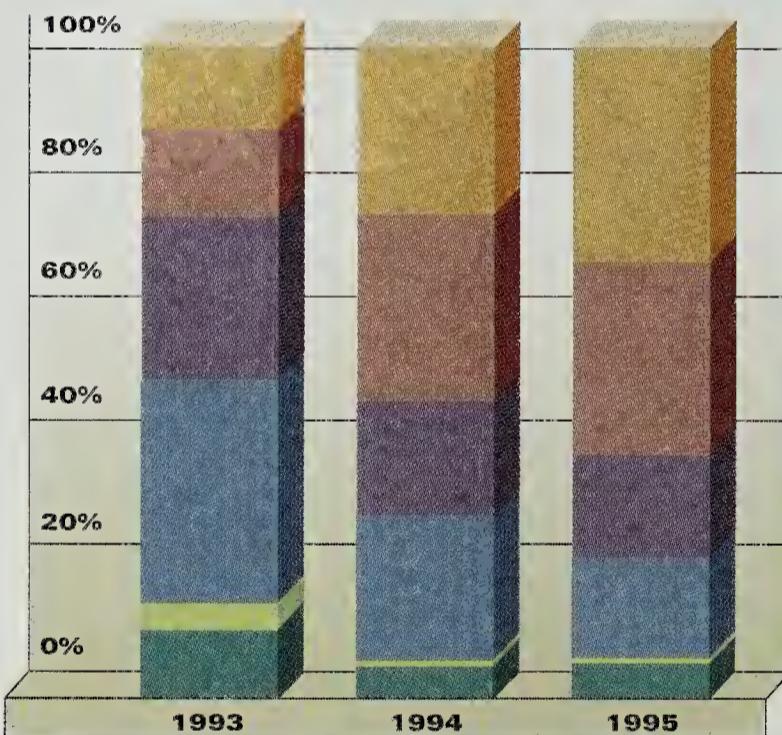
Base: IS executives at large/medium businesses
1993: 1,005 sites; 1994: 800 sites; 1995: 700 sites

Source: IDC Japan, 1995

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PROGRESS SOFTWARE

tions (GIS) 3600 Unix server and 40 Unix and Microsoft Corp. Windows NT servers spread over 15 branch offices running 10Base-T LANs. The system handles all sales, collections, billing and payment data from the company's mainstay business: general equipment and cellular telephone leasing.

The company opted to keep its accounting function centralized on a Fujitsu mainframe because it was unable to find Japanese-language Unix accounting software, said Kuinio Ishiguro, managing director and department manager of Project I at NTT Leasing.

SMOOTH FLOW

The goal was to smooth out the jagged flow of information across the 400-person company, Ishiguro said. In the past, a salesperson would use a dedicated word processor to write out a new contract, in addition to other forms that contained the same information such as notifications to the collections department and to dealers that deliver the cellular phones.

Now, branch-office salespeople work on-line with the central server and enter data using an in-house-developed graphical user interface on their PCs. At night, the data is batch-processed jointly by the AT&T GIS 3600 and the Fujitsu mainframe.

Though Ishiguro conceded that it's still too early to quantify the advantages of the system, he said he expects salespeople will now spend more time outside the office leasing phones than chained to their desks entering data. Already, he said, the time to put together a financial report has been cut from two months to about 15 days.

In spite of the U.S. experience, cost containment is the defining theme at Nomura. Over a period of six years and for a cost of $30 billion yen ($357 million), Nomura is pruning its trading system from more than 30 mainframes to three. All branch-office activities, including order entry, settlement, client portfolio and

market analysis, will be handled by the client/server system, while client order records and account debits/credits will stay on the mainframes, according to a Nomura Research project manager.

More than halfway into the project, Nomura is reaching for standard hardware and software as a way to cut costs, the manager said. "We spent enough money on the third-generation system. Too much money," he added.

The completed system will have 9,000 Windows PCs and 500 PC servers spread throughout the Tokyo headquarters and 135 branch offices, which run Ethernet LANs. For software, the system uses both Oracle Corp. and Sybase, Inc. databases, IBM's Message Queuing and Hitachi Ltd.'s OpenTP1 on-line transaction processing monitor. Managing the networked system is Hewlett-Packard Co.'s OpenView and Microsoft's System Management Server.

The plan is expected to cut monthly information technology costs by well over $10 million while slashing by 80% the 3 million-plus pages of documents Nomura generates monthly. Moreover, the new system should enable the company to shift hardware and networks among branch offices to accommodate changes in financial market activity.

Declining to cite details, Nomura officials acknowledged that the heterogeneous environment has posed serious compatibility challenges, and some observers wonder whether the company can successfully pull off its ambitious plan.

But if Nomura succeeds, it could pave the way for other Japanese companies to dive into grand downsizing projects, as many companies are hesitating before placing bets on client/server, observers say.

"Once the Japanese decide to do something, they do it in a rather spectacular fashion," Andersen's Sullivan said. ◪

Guth is the IDG News Service correspondent in Tokyo.

CULTURAL CATCH-UP

A manager at one of Japan's largest systems integrators tells a story of the president of a Tokyo firm who wanted a small information system to help run his business: selling salmon eggs to Japan's sushi shops.

When the system was completed, one small kink remained. The president didn't like using the English letters "Y" or "N" when the system queried him for a Yes or No answer. The problem was fixed by placing a green sticker on the computer's "Y" key and a red sticker on its "N" key.

And then there's the daily close-of-business ritual of unplugging all electronic office equipment that some Japanese companies, including NTT Leasing, still practice. That would be fine except that NTT Leasing branch-office employees are also disconnecting AT&T GIS Unix servers, unwittingly causing database backup and recovery problems.

Though these difficulties are not shared by most Japanese IS managers, these examples illustrate the challenges some companies face in bringing users up to speed with the PC-oriented, client/server culture.

U.S. and European visitors to a Japanese office are often surprised to see not PCs but piles of paper dominating desktops. The complex Japanese language was best written by hand until the fairly recent introduction of word processors with double-height characters. However, some executives are still so resistant that, when issued a PC, they continue to handwrite memos for secretaries to input. "It's hard for high-level people to use keyboards," said Kensuke Nagame, general manager of Toyota's system planning department.

ATM ANXIETY

ETHERNET NETWORKS ARE FILLING UP, BUT THE NEXT GREAT HOPE — ATM — IS STILL RAW. PIONEERS NEED RESOURCES, TIME, TRUSTWORTHY VENDORS AND TECH-SAVVY USERS. OTHERS ARE LOOKING TO SWITCHED ETHERNET.

W hit Richardson saw the writing on the wall in the spring of 1993: Users, he knew, would one day fill up all of Phibro Energy USA, Inc.'s Ethernet connections. So Richardson, Phibro's LAN manager, ran fiber cable to all 325 user desktops at the oil refining company in Houston.

History tells the rest. Fiber Distributed Data Interface (FDDI) prices never declined, and eventually, Phibro lost interest in it as a desktop technology. But now Richardson is looking at a 12- to 24-month window before the network is saturated. So just this past spring, he began examining networking's latest Holy Grail: Asynchronous Transfer Mode (ATM).

What Richardson found was more waiting. "I was surprised few vendors were delivering ATM products, and customer experience was limited," he said. "I expected the technology to be much more developed than it was."

No wonder. Interest in and talk about ATM has reached hyperbolic proportions during the past few years. The technology's flexibility (ATM is able to run on wide-area networks, backbone networks and desktops), high transmission speeds and support for many media types have not only LAN managers but also top executives drooling with anticipation. The technology could easily support bandwidth-hungry client/server applications, ranging from engineering designs to

BY PAUL KORZENIOWSKI

ON THE FENCE

COMPANY
Phibro Energy USA, Inc.,
a $7.2 billion oil
refinery in Houston.

CURRENT DESIGN
10Base-T Ethernet
to the desktop.

GOAL
To avoid network saturation
within the next 12
to 24 months.

APPROACH
Evaluating ATM and
switched Ethernet.

ATM STANCE
"If ATM were available
today, we would
implement it. But . . .
switched Ethernet is
becoming more
attractive to us."

Whit Richardson, LAN manager, Phibro

ON THE EDGE

COMPANY
Texas Instruments, Inc.,
a $10.3 billion semiconductor
and systems maker in Dallas.

CURRENT DESIGN
10Base-T Token Ring,
with FDDI to the desktop. FDDI,
T1 and T3 on the backbone.

GOAL
To redesign the worldwide
WAN in order to meet ever-
increasing traffic volumes
created by 60,000 users,
some of whom need to
exchange complex
engineering documents.

APPROACH
Building a seven-site production
ATM WAN for fall implementation.

ATM STANCE
"ATM offers us more speed
and more flexibility than any
other high-speed WAN service.
[However,] I don't view it as a
mature backbone technology,
[and] ATM costs are still too
high for most desktop users."
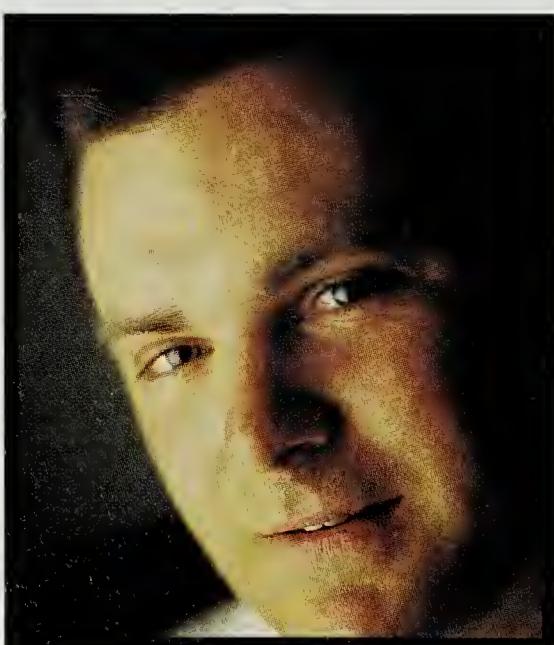
*Paul Breaux, network engineer,
Texas Instruments*

groupware to videoconferencing.

But today, there are more Republican candidates for president than companies using ATM for daily business applications. The fact is, ATM is raw and not ready to replace Ethernet as corporate America's dominant networking technique.

"Companies are now beginning to separate the promise of ATM from the reality of ATM," said David Goodtree, an industry analyst at Forrester Research, Inc., a Cambridge, Mass., market research firm.

One of these realities is that while ATM is a connectionless protocol and so is supposed to allocate bandwidth dynamically from 1M to 5M bit/sec., current ATM switches do not support this feature. Instead, users divvy up bandwidth as if ATM were a connection-oriented protocol.

Plus, connectionless protocols often move data through a series of devices before it reaches its destination. Data can be sent even without a clear connection between the two sites. The ATM Forum, a standards body, has been developing error-checking schemes to retransmit dropped packets of information.

Furthermore, ATM was designed to carry voice, data and image information on one line. But ATM switches are able to work with only one type of transmission: mostly data. Because you have to purchase two devices or more to fulfill ATM's multimedia promise, the cost of ATM installation is still prohibitive.

Despite these and other rough edges, some firms have had enough success with initial ATM tests that they are taking the next step: finding ways to exploit ATM's flexibility and large amounts of bandwidth.

Texas Instruments, Inc. is one of those firms. The traffic volumes on its 60,000-user worldwide T1/T3 network caused the company to rethink its entire WAN in the spring of '94. The promise of fast transmission speeds — up to multiple gigabits per second — was the attraction of ATM, according to Paul Breaux, a network engineer at TI.

Earlier this year, TI connected seven ATM test sites in the Dallas area, and it plans to move into production mode this fall. The network, which provides three times the bandwidth of the previous WAN, lets users exchange complex items, such as engineering documents, that otherwise would slow the network to a crawl.

Once the change is made, Breaux expects users will require only 45M bit/sec. of the 155M bit/sec. available. Longer term, TI should be able to boost speeds to the gigabit range without installing a new WAN.

OBSTACLES YOU MAY ENCOUNTER
But TI was fortunate. For one thing, while carriers might be willing to work with $10 billion firms on ATM trials, considering the telecommunications revenues they rack up, they usually tell smaller companies to wait for ATM WAN services.

Another hindrance is that ATM WAN services are available in only a handful of locations, with nationwide service at least three years out. Meanwhile, carriers need to upgrade or replace existing (and expensive) central office equipment in order to offer ATM. Central office equipment suppliers, such as Fujitsu Ltd. and Newbridge Networks Corp., have just begun ATM upgrades.

In addition, most carrier equipment is able to support only 45M bit/sec. transmissions, not the 155M bit/sec. ATM promises.

Other companies, such as Amoco Corp., have been testing ATM for years but have no definite production plans. The oil company jumped on the ATM bandwagon in 1992 because it needed a higher-speed, more flexible WAN. Because the WAN supports 50,000 employees around the world, David Beering, a senior staff telecommunications analyst at Amoco, wanted to prepare for bandwidth-hungry users.

In early 1994, Amoco connected five sites on an ATM WAN. Test applications included file transfer programs, X Window Systems, real-time

video and World Wide Web software.

But "because it is new technology, ATM cannot be easily integrated into our existing networks," Beering said. For instance, ATM services are not compatible with existing WAN services, although the ATM Forum is working on connection techniques with frame-relay networks.

LAN integration is also missing. Companies want to connect Ethernet networks to their ATM networks, a capability dubbed LAN emulation. The ATM Forum completed work on this version earlier in the year, but vendors have not had time to incorporate it into their products.

Yet Amoco remains optimistic about ATM's potential. "There will not be a day like June 2, 1997, when ATM becomes mature for corporate use," Beering said. "Vendors are making progress addressing limitations, and ATM is maturing."

In preparation, Amoco is trying to find suitable places for the technology. It seems to have found one in its exploration and oil production group, which has begun building an application that identifies potential oil sites.

If the system reaches fruition, it will be one of the first ATM applications developed by a large company. "Right now, companies spend a lot on ATM without getting much back," Beering said. "We expect that will change in the future."

The truth is, ATM represents overkill for most applications. "Few organizations run applications that need ATM's high transmission speeds," Forrester's Goodtree said.

SPEED-HUNGRY APPLICATIONS

The U.S. Naval Command, Control and Ocean Surveillance Center's Research and Development Division (NRAD) in San Diego is an exception. It supports 2,500 scientists and engineers working with high-performance workstations.

In 1993, a group of scientists and engineers began to tinker with applications that track ocean tides and changes. Network connections, which consisted of 9.6K bit/sec. ca-

ble, Ethernet and FDDI links, quickly became strained.

In the spring of 1994, the naval group began a pilot test with 50 users on backbone and desktop ATM connections. The group has been able to connect the equipment to the workstations so users now have access to more bandwidth, said John Switlik, a project engineer at NRAD.

The NRAD users are mostly computer-literate scientists and so can help solve ATM problems. However, pinpointing problems on ATM networks can be tedious because ATM management systems are new and do not provide as much information as those available with Ethernet. For this reason, Switlik said he would not recommend that companies roll out ATM to most users yet.

But companies such as Phibro do indeed need more bandwidth now. And that's where switched Ethernet comes in. It provides users with their own 10M bit/sec. transmission line and has the potential to reach 100M bit/sec. with "fast" Ethernet.

Not only does the technology offer a low learning curve, but its connections are also cheaper than ATM links. A 10M bit/sec. switched Ethernet card costs about $150; a 100M bit/sec. Ethernet card hovers near the $350 mark. In comparison, ATM adapter cards are priced from $750 to $1,000.

The Dell'Oro Group, a Menlo Park, Calif., consulting firm, estimated that corporations will spend $1.3 billion worldwide on switched Ethernet products this year compared with $191 million on ATM equipment.

Still, some firms are reticent to jump to switched Ethernet with ATM apparently just around the corner.

Back at Phibro, Richardson is close to a final decision: "I will check [ATM's] status again as the year ends. If vendors have made little progress, we probably will decide to go with switched Ethernet." ◪

Korzeniowski is a freelance writer in Malden, Mass., who specializes in networking issues.

ON THE WAY

COMPANY
Amoco, Inc., a $30.3 billion energy company in Chicago.

CURRENT DESIGN
10Base-T Token Ring, with FDDI to the desktop. FDDI, T1 and T3 on the backbone.

GOAL
To ensure high speeds and flexibility at the WAN, desktop and backbone levels for 50,000 employees worldwide.

APPROACH
Testing and examining ATM on the desktop, backbone and WAN. Also seeking out suitable ways to exploit ATM and build an ATM application to identify potential oil sites.

ATM STANCE
"Because it is new technology, ATM cannot be easily integrated into our existing networks. [But] vendors are making progress addressing limitations, and ATM is maturing."

David Beering, senior staff telecommunications analyst, Amoco

Kansas City Power & Light Co. is a rare bird: an electric utility without a mainframe. But the $868 million Missouri company is unusual in another way: It undertook its eight-year, multimillion-dollar migration to distributed computing without doing a return on investment (ROI) study.

"You can't successfully leverage technology if you're tied down to ROI," said Doug Morgan, vice president of technical services at the utility. "We invested in client/server because it was a necessary ingredient to our business strategy."

A few years ago, Morgan would have been laughed or thrown out of some executive suites for statements like that. But it's no longer considered lunatic to talk about distributed computing's intangible yet significant contributions to business value. Widely hailed as the key enabling technology for re-engineering, client/server has helped innumerable companies shoot for — and sometimes hit — those vaunted tenfold improvements in customer service, cycle time and quality.

Such benefits provide a great vehicle for long-term competitive advantage. Yet they hardly make a blip on the radar of most ROI models, which pick up only projects that return greater than their cost of capital. That leads Thornton May, vice president of research and education at Cambridge Technology Partners, Inc. in Cambridge, Mass., to declare ROI a dead science. "It's a throwback to the days when business value was decided by people with green eyeshades."

Talk to information systems executives, however, and you discover that reports of ROI's death are greatly exaggerated. Although senior managers and line executives — today's arbiters of business value — may appreciate client/server's soft benefits, this doesn't often show up in the capital planning process.

Exceptions aside, client/server projects today get approved largely because they clear internal rate of return or net present value investment hurdles. "Everything must pass the sniff test," said Robert Tabb, MIS director

the new value brokers

With client/server investments, bean counters can't paint the whole payback picture. IS needs to highlight business improvements.

at Ryder Systems, Inc. in Miami. At Ryder, that means a project's payback must occur in three years or less. Four years, and the project is decidedly malodorous.

Improved information sharing and any other qualitative benefits usually don't enter into the equation. Case in point: a $600,000 project completed in 1992 by Arizona Public Service, the state's largest public utility. It involved migrating the nuclear power plant's outage scheduling application from an IBM mainframe to a Microsoft Corp. Windows NT-based configuration.

The project paid for itself in just seven months and has already saved the utility millions of dollars, according to project manager David Blythe. "We vastly improved productivity and communication between departments, but that's not why we did the project," Blythe said. "The hard-dollar savings were the key motivator."

RETURN ON INSANITY

It's hard to fault a project with those kinds of numbers. Indeed, some client/server veterans see the current quasi-rigorous use of ROI as a return to sanity.

Companies that raced to embrace client/server in the early '90s often didn't bother with ROI studies. And those that did often based them on an inaccurate understanding of the technology's costs and complexity. Dick Hudson, vice president of IS at Houston-based Global Marine, Inc., puts himself in the latter category.

"We thought we were giving up a multimillion-dollar mainframe shop for a multithousand-dollar PC environment," said Hudson, who launched the company's move out of the glass house in 1991. "What we ended up with is

BY BRIAN MCWILLIAMS

a multimillion-dollar client/server environment with a much higher degree of complexity."

To be sure, getting a grip on a client/server project's costs — the "I" in ROI — is a challenge for any company today. First, there's the slippery subject of resource load estimates, Ryder's Tabb said.

"Typically, you're building a completely new application, so it's hard to estimate usage patterns up front. You may end up with insufficient bandwidth and have to upgrade servers, networks and support staff," he said. The result: investment cost creep.

What's more, Tabb contended, many companies — Ryder included — overestimate the economic life of client/server investments: "Our applications may be around for five years, but we're turning over PCs every 24 months," he said.

Also bollixing up tidy ROI estimates are the sizable network infrastructure costs a company incurs during its first foray into client/server. "It's like laying railroad track," Tabb said. "Are you going to assign the cost to the first train that uses it?"

Do so, and that project will surely have a poor ROI. Consider what happened at Duke University Medical Center in Durham, N.C. To improve the query capability of Duke's database for cardiovascular diseases, Dr. Donald Fortin, an assistant professor of medicine in the center's cardiac division, led a 1991 migration off a Digital Equipment Corp. VAX minicomputer onto a Windows NT server-based platform. The price tag was about $900,000, Fortin said. But the project also got socked for an additional $1.6 million to bring the application to 700 desktops scattered around eight buildings (see story page 52).

"The network is going to be used for a lot of business functions besides the database. So how much of the infrastructure burden do we attribute to the database project? Unless you know where to draw the line, it's diffi-

cult to calculate your return on investment," he said.

Ryder tries to get around this quandary by evaluating its portfolio of potential client/server applications from a macro level, Tabb said. If the aggregate ROI of all the projects, including the network costs, looks good, Ryder will authorize the infrastructure expenditure as a business foundation cost. "Then you just look at each application and determine what it drives in incremental infrastructure costs," he said.

Another approach, suggested by Adrian Kole, president of AGK Associates, Inc. in West Orange, N.J., is to make your first client/server project a killer application that everyone wants. Then ask users to pay, out of their own budgets, for their portion of the infrastructure: local LAN administration, routers and so on.

"Users don't like charge-back costs. But if they feel a project is beneficial to them, they'll find the money in their budgets to pay for the network," Kole said.

THE R PART

If calculating a client/server project's investment costs looks difficult, tallying the "R" in the equation is even harder. That's particularly true for marketing and sales applications, where the goal usually isn't to reduce business costs but to enhance revenue. "There's a lot of guesswork about what the real revenue opportunity is," Kole said.

Measuring the benefits of Duke's cardiac database project in ROI terms seems so difficult as to be absurd. What's the net present value of being able to deliver better information more rapidly to cardiologists? "That's where the ROI calculation becomes very murky," Fortin said.

And some managers worry that emphasis on financial yardsticks could lead companies to fund only projects with demonstrable, quick paybacks. In the process, they might shun projects weighted toward qualitative benefits, projects that may con-

■ To realize ROI, corporations must standardize on infrastructure components (i.e., workstations, routers, applications, groupware); enforce enterprisewide technology and business process standards; and appoint a chief technology officer to oversee strategy.

So your CEO wants cost justification for your next client/server project, and value creation doesn't cut it. Well, the place to start is with a clear understanding of your business objectives, installed technology, infrastructure (and upgrades), evolving staff needs, application development, migration and coexistence exigencies.

You'll also need to estimate technology and people costs over a three- to five-year horizon, how fast technology will evolve, how quickly network traffic will build to a crescendo and how fast you expect to achieve benefits.

Here's an ROI model created by Adrian Kole, president of AGK Associates, Inc., a West Orange, N.J., information technology consultancy. It should help you budget for enterprisewide client/server deployment.

A hypothetical firm, NewCo, hopes to maximize its client/server investment over the next five years by developing an enterprise wide-area network that will introduce collaborative computing to departments and customers, using Notes and the Internet. In addition, new client/server applications will be developed to replace legacy order processing/billing, customer service, materials management, product development and finance systems. As these systems come on-line, mainframe hardware and software maintenance costs decline, as do new client/server development expenses (see chart at bottom).

Targeted business objectives for the client/server strategy include reduction of administrative staff by 10% and IT expenditures by $1 million annually; reduction of the order preparation process from six to two weeks and improvement in annual cash flow of $10 million; use of just-in-time purchasing to reduce inventories by $4.8 million; and reduction of customer response times from five minutes to 10 seconds.

NewCo

REVENUE: $400 million

TOTAL IT BUDGET: $14.4 million

CLIENT/SERVER BUDGET: $5.5 million

OPERATIONS: Five domestic, decentralized business locations

STAFF: 1,500 employees

TECHNOLOGY ASSUMPTIONS

- 1,500 networked workstations, Notes groupware and E-mail infrastructure
- IBM, Digital centralized applications accessed via emulation programs over WAN
- Mix of homegrown and packaged client/server applications accessed via PCs from workgroup and departmental servers

MANAGEMENT ASSUMPTIONS

- Each local business unit must justify and pay for client/server infrastructure
- User departments handle LAN administration
- Central IS responsible for applications accessed via WAN

CLIENT/SERVER SPENDING REQUIREMENTS

You'll need to first get your arms around client/server computing costs . . .

	IS STAFF	ANNUAL COST
LAN ADMINISTRATION	20	$1.4M
WORKSTATIONS/SERVERS (includes add-ons, Windows access, TCP/IP and team links, software and depreciation)		$2.5M
ROUTER MAINTENANCE		$35,000
SERVER MAINTENANCE		$141,000
OVERHEAD (includes Notes administration, help desk, E-mail and network management)	11	$1.5M
TOTAL	31	$5.5M

TOTAL IT COSTS**

. . . and then consolidate with the central IS budget.
Though staffing remains flat, consulting, equipment and application development costs decline.

	1995	1996	1997
Staff	56	56	56
Staff expenses	$4,910.10	$5,147.10	$5,420.70
Consultants*	$1,500.00	$1,500.00	$750.00
Rent and associated costs	$670.20	$670.20	$670.20
Depreciation	$331.90	$350.00	$375.00
Communications	$95.10	$110.00	$125.00
Other costs	$111.10	$116.70	$122.50
Mainframe equipment	$589.30	$589.30	$194.30
Software	$714.70	$720.00	$230.00
TOTAL CENTRAL IS COSTS	$8,922.40	$9,203.30	$7,887.70
Client/server infrastructure	$5,506.70	$5,782.00	$5,925.00
TOTAL IT EXPENSE	$14,429.10	$14,985.30	$13,812.70
Increase/Decrease		$556.20	($1,172.60)

*Predominantly development costs

**COSTS IN THOUSANDS

tribute more to the corporation's long-term strategic objectives.

As it turns out, most companies are not slaves to their investment scenarios. The decision-making process is often less rigorous and more subjective than quantitative ROI formulas would suggest. "Sometimes you just buy the new bucket truck because it's a better tool than having people climb the pole. You don't even look at the dollars," Kansas City Power & Light's Morgan said.

Obviously, companies such as the utility are not writing blank checks to just any client/server project that makes business sense. Morgan reported that, adjusted for inflation, his IT budget has been flat since 1990. The reality at most organizations is that the pot is only so big, and senior management must reconcile many different demands for capital.

"They're looking at a number of things — strategy, ROI, even politics — to get the final answer," Tabb said.

"If your project has a squishy return, you'd better be able to explain why it and not the project from another sponsor should get funded."

To ensure that its investments are aligned with long-range corporate strategy and to depoliticize the resource allocation process, McNeil Consumer Products has adapted a strategic planning tool known as the "balanced scorecard." A team of senior managers at the Fort Washington, Pa.-based company scores each proposed project not only on its predicted financial returns but also on its impact on customers, internal business processes and organizational learning and innovation. The overall score, scrutinized with the project's price tag, becomes the basis for deciding which projects get funded.

ON THE FLY FINANCING

Increasingly, negotiations of this sort don't take place as part of an orderly, fiscal budgeting process, Cambridge Technology Partner's May said. Dur-

ing the year, the competitive landscape changes. Recognizing this, companies are making a greater percentage of their budgets discretionary and allocating project funds on the fly.

To win in this fluid environment of dicker and compromise, IS groups must stop acting like technology procurement agencies and instead become value brokers, May said.

"You need to get in the senior vice president of marketing's face and say, 'Here is the project, and here is the multidimensional value it delivers. Is it the system you want?' Then you barter over cost and functionality," he added.

In the end, May said, all client/server investment scenarios come down to one crucial question: Whether you can unambiguously demonstrate progress toward mutually agreed on business goals. ◪

McWilliams is a freelance writer based in Durham, N.H.

Playing the numbers game

The enlightened know that client/server's soft benefits are at least as important as its hard-dollar returns. But try telling that to the numerically oriented folks at Washington-based Federal National Mortgage Association (Fannie Mae).

"People here don't speak English — they speak numbers," said Chief Information Officer William Kelvie.

So imagine Kelvie's anxiety early last year when the lender's board of directors requested detailed ROI data on its technology spending. The board wanted word directly from the business sponsors of more than 30 recently completed projects, including some 20 client/server efforts.

Using a standard ROI algorithm from KPMG Peat Marwick, Mary Cowden, a specialist in Fannie Mae's IS group, asked each project sponsor to estimate the applications' financial return, if any, in terms of increased revenue, reduced operating costs and decreased support costs.

Then Cowden ran the numbers. For competitive reasons, Kelvie declined to provide specifics. But "it turned out to be a startlingly good set of investments. We got a very healthy return."

Several sponsors directly attributed new revenue streams to client/server projects. In some cases, for example, the technology enabled the creation of a new prod-

Fannie Mae's Kelvie conducted a formal ROI study — and was surprised

uct. Other sponsors credited client/server projects with significant annual cost reductions. One application that optimized cash management, for instance, provided millions in savings on a $200,000 investment, according to Kelvie [CSJ, Special June Issue, page 22].

Kelvie said he believes rigorous ROI analysis is a skill set that IS managers need to refine. "There will always be skeptics in the organization who understate the contribution of technology. But you need a way to speak to this quantitative community, and ROI gives you that."

Now that most people at Fannie Mae are feeling bullish about what client/server can do, Kelvie said, ROI assessments serve another valuable function: prioritizing which projects his group will take on next.

"We are besieged with requests to do work, and I don't want it to seem like we're favoring one group over another. ROI is one of the ways we make sure we're doing the projects that will have the biggest impact."

The
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Dataquest

Informix's Phil White on AT&T WorldMark® Servers.

pentium

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Phil White, CEO, Informix Software

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Focus on Servers

The term "rightsizing" — originally used to define the requirement for corporations to change to a more flexible business model — is now being applied to technology infrastructures. A company decides it needs to evolve its information architecture toward a more flexible, responsive and cost-efficient environment — one that is ultimately more profitable.

The rightsizing transformation will affect all levels of computing, but today is focused at the server level. Server-based information technology is being re-hosted primarily in two ways: via uniprocessor deskside servers on LANs and through the implementation of client/server environments.

More than half of all servers that have been shipped worldwide have been uniprocessor deskside servers. Although these servers are limited in performance scalability, their popularity has remained high — perhaps because their prices have been rapidly dropping.

The alternative to these servers — consolidation of PC deskside LAN servers into client/server environments — got a jumpstart because there was no integrated approach to managing PC LAN environments. The popularity of PC LAN consolidation is growing because it provides the head of MIS with a manageable, highly available and reliable architecture and because it offers users a workgroup computing framework that will enable them to easily deploy LAN applications throughout the enterprise. If both of these groups are happy, it makes for an unstoppable trend.

The recentralizing of entry-level deskside uniprocessors onto more scalable midrange servers — the crux behind PC LAN consolidation — will be the next high growth sector in the shift to distributed computing and client/server. Dataquest believes that the enterprise consolidation portion of the upsizing market will grow to over $13 billion worldwide by 1998.

The Scalable Server Proposition
in the Distributed Enterprise

Originally, the term "rightsizing" was supposed to define a new corporate requirement for change. That change was to be a transformation of the corporation to a more productive and more flexible business model.

But too often, the term was used by business writers and editors to refer to the downsizing of entire industries or the re-engineering of corporate processes by companies. At many large companies, rightsizing could mean anything — whacking heads, closing unprofitable divisions or even re-thinking the entire strategy behind their core competencies.

In many ways, the application of rightsizing to the technology infra-structure of a company is no different than the rightsizing of the overall company — its people, its organizational structure, its products and its business processes.

Rightsizing a technology infra-structure is a process in which line-of-business managers (i.e., those who apply technology) and the IS organi-zation (i.e., the creators, translators and integrators of technology) together decide how best to evolve a company's information architecture to a more flexible, responsive and cost-efficient environment — one that is ultimately more profitable.

This process of technology trans-formation requires the commitment of both the creator of the business architecture and the IS professional who implements the technology solu-tion. To build the appropriate technol-ogy solution, the creator of the business architecture must first: 1) define the types of data that matter to the consumer; 2) determine how the data is to be analyzed; 3) determine

Rightsizing a technology infrastructure implies a process in which line-of-business managers and the IS organization together decide that a company needs to evolve its information architecture toward a more flexible, responsive and cost-efficient environment — one that is ultimately more profitable.

who needs what data, and in what form, and 4) decide where and when the data is to be distributed.

Rightsizing evolution

The entire history of computing has followed an evolution to rightsiz-ing — from distributed access (where the mainframe was the system), to dis-

tributed processing (where the network was the system) to distributed data (where the information is the system). To some observers, the purest form of client/server computing is one in which all technology infrastructures — determined primarily by an applications architecture — can transparently distribute *all* data (graphics, voice and text) to *all* users. Unfortunately, although "pure" client/server computing is a simple concept, the term itself is susceptible to many definitions, primarily because each vendor who wants a piece of this "corporate transformation" pie wants the user to believe that its approach is the de facto industry approach.

Dataquest has a simpler definition of client/server computing. It is this: *Client/server is a network-extensible environment that includes both hardware and software, which in its most productive form distributes computing resources between a client and server. The client(s) is usually a desktop or mobile device, and the server(s) is usually a back-end system.*

Every physical device has some form of electronic intelligence; i.e., a client can never be a dumb terminal. The term "environment" implies that the most effective client/server implementations include the best integration of many components: client and server hardware, operating systems, networking and middleware architec-

tures, and, in recent implementations, the applications architecture.

Upsizing and downsizing

The rightsizing transformation in a corporation suggests two possible approaches: downsizing or upsizing. Downsizing refers to the migration of host-centric corporate applications into distributed processing client/server environments. Upsizing refers to the scalability of a server to handle the processing needs that are

required in consolidating a LAN environment.

Although the downsizing migration has become a fact of life, recent Dataquest research indicates that most CIOs and IS managers will overhaul their host-centric environments slowly, in a step-by-step fashion.

The majority of corporate computing installations combine host-centric and client/server environments, with "mostly host-centric" currently the second most popular type of installation (and likely to remain #2 for the next 12 to 24 months). Dataquest believes that by 1998, the computing environment in nearly every Fortune 1000 company will be an almost entirely client/server environment (see Fig. 1).

The rightsizing transformation will affect all levels of computing, but in

FIGURE 1

Current and Future Mix of Host-Based and Client/Server Systems

Source: Dataquest

the near term, it is the upsizing part of the equation that will garner the most scrutiny and the most sizeable investments from buyers. Most of this scrutiny and investment will be not at the client level but at the server level.

When it comes to upsizing, there are two schools of thought pertaining

to optimizing the benefits of distrib-uted computing through rehosting (or outright migration) of server-based information. One camp firmly favors the upsizing proliferation of the uniprocessor deskside server on the LAN, the growth of which depends on

Despite being limited in terms of performance scalability, the uniprocessor deskside server has accounted for more than half of all worldwide shipments of servers.

three buying criteria: the network operating system, or NOS (in the past, primarily NetWare); the favored opti-mization of certain horizontal applica-tion architectures vs. a vertical market-biased architecture, which had led to the term "applications server;" and the continued purchase of low-cost, low-performance file servers and print servers.

The other upsizing camp believes in the consolidation of networked and client/server environments. This con-cept is also known as the recentraliza-tion, or re-mainframing, of the virtual or distributed office.

This trend suggests that the midrange of the server marketplace — what Dataquest calls the superserver or midframe sector — will gain sizeable acceptance among buyers. The pur-

chasing drivers here include support for high availability access to data, sup-port of multiple operating systems, support of systems, network and data management, and some linearity in how the hardware architecture scales in terms of performance. Scalability can be achieved in two ways: either through symmetrical multiprocessing or clustering capabilities.

Ubiquitous deskside server

Despite being limited in perfor-mance scalability, the uniprocessor deskside server has accounted for more than half of all worldwide shipments of servers — even if we include all desktop-as-server through mainframe-as-server segments of the worldwide market. This fact of the market was particularly recognized by vendors who, early on, developed technology and marketing alliances with both Intel (for the engine — the 486 and

Pentium microprocessors) and Novell (for the transmission — NetWare).

But there are other reasons for the success of the uniprocessor server market — reasons related to market timing and general overall trends — that it would be helpful for the buyer to understand.

At the same time that some desk-top PCs were being re-configured and others upgraded as simple file servers and print servers, the price/perfor-mance war that had come to dominate the desktop PC business model was spreading to the market for low-end servers. This fueled the expectations of buyers that they could negotiate aggressively with server vendors to get the most features for the lowest price.

The IS executives and network management professionals for whom the PC server was the engine of choice had three main purchase criteria: brand name, vendor reputation and

FIGURE 2

PC Server Selection Criteria

Percentage of Respondents
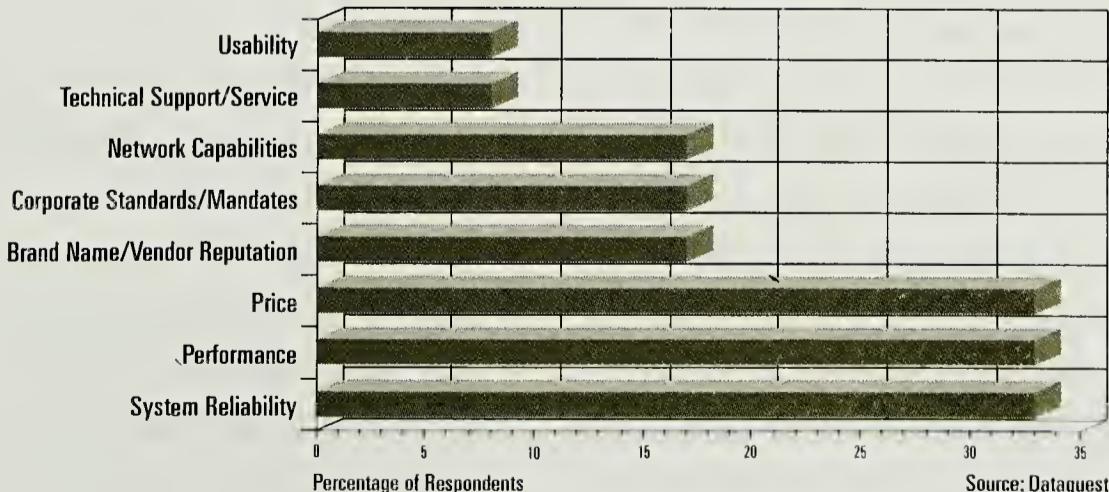
Source: Dataquest

system reliability. These three buying factors were corroborated by Dataquest's survey of 250 Fortune 1000 companies (see Fig. 2).

Vendors of mostly "Intel-inside" PC servers bolstered their strategy to ramp up acceptance of the deskside PC uniprocessing server through a master stroke: exploiting multiple sales channels, in particular VARs and VADs (value-added resellers and value-added dealers).

Network management elusive

Despite the rapid proliferation of PC LAN environments which began in the mid-1980s, there was no accompanying integrated approach to managing them. As a result, the opposing view to PC server proliferation — consolidation of PC deskside LAN server environments — got a jumpstart.

The main reason to consolidate PC LANs was to provide a more manageable and more reliable commercial strength corporate computing architecture. The trend proved unstoppable, for consolidation not only favored the MIS chief's bias toward a central control point for the company's computing resources, it also offered a cost-effective and reliable re-mainframing of the enterprise (including many of the best features of the commercial high-end systems environment) while promising to provide a path to even wider deployment of LAN applications.

By early 1993, many former vendors of PC-based file servers and print servers had, as part of their decision to court corporate purchasers of enterprise servers, begun to adopt both symmetrical multiprocessing and clustering technologies. Years earlier, the systems deployment required to satisfy the needs of the enterprise server arena had been made possible by RISC players such as Hewlett-Packard, IBM, Sun Microsystems and Digital Equipment Corp., and selected CISC players such as AT&T GIS, with scalable minicomputer platforms.

Three vendors that have been successful in selling to the PC LAN consolidation market are Tricord Systems, Digital Equipment, and most recently,

One of the goals of the consolidation of PC LANs was to provide a more manageable and more reliable commercial strength corporate computing architecture.

an aggressive AT&T GIS. But each of these three vendors has had a different approach to consolidation.

Tricord began in this arena by aiming scalable superservers at the market for high-end file and DBMS servers. Lately Tricord has renewed its emphasis on the enterprise server arena to approach the image server and video server portion of the market.

Digital has been re-architecting its AlphaServer line, emphasizing the high end of the DBMS server sector with the AlphaServer 8200 and 8400, while using the AlphaServer 2000 to continue its push into small and medium-sized companies looking to consolidate and/or re-host their deskside PCs with a scalable 64-bit RISC solution.

Meanwhile, AT&T GIS, one of the few players in the Intel-inside server arena to be a one-stop, full-service vendor, has put its own spin on PC LAN consolidation.

First of all, the company has refined its vertical market push by focusing on the retail, financial and communications industries. Its emphasis on these verticals comes as no surprise, since the company has already become a major client/server player in these same industries.

More recently, AT&T GIS has overhauled its entire server strategy. The most important part of this overhaul was the company applying its considerable experience with Unix to Windows NT, with the goal of providing high-level functionality to Windows NT Advanced Server for IT environments. In this area, its product commitments include porting to Windows NT, by year-end, the following: AT&T Top End transaction processing, AT&T LifeKeeper FRS Clusters (high avail-

ability and clustering), and AT&T Net-Vault and Comm Vault network backup and restore.

The Unix-based Top End product is a respected technology that is widely installed in enterprise networks. Users view LifeKeeper FRS Clusters as one of today's better Unix-based implementations of clustering technology. Add to this mix AT&T GIS' full-service deployment capabilities, and the company's differentiation as a enterprise-biased consolidator and client/server vendor can be said to rest on: unswerving loyalty to Intel and Microsoft; a renewed focus in systems integration (exemplified by its customer-focused team concept); an aggressive attitude toward bringing VARs on board (demonstrated by its Partners for Profit program); and a reputation for being vertical market-driven.

Despite the common minicomputer legacy of Tricord, Digital and AT&T GIS, their current products show distinct differences from low-end PC servers, particularly when it comes to selection criteria for scalable servers. These criteria are based on a Dataquest survey of 250 Fortune 1000 IS executives (see Fig. 3).

According to this survey, vendors of scalable midrange servers, who built their reputations on providing robust commercial features such as high availability, networking interoperability and overall systems scalability and

expandability, are now being scrutinized by buyers on the same factors they use to judge vendors of low-end PC servers: brand name/vendor reputation, price/performance and system

for LAN consolidation) resulted in a revenue stream of $6 billion. Dataquest forecasts that the worldwide market for enterprise LAN consolidation will surpass $13 billion by 1998.

FIGURE 3

Top 12 Selection Criteria for Scalable Midrange Servers

Percentage of Respondents   Source: Dataquest

reliability. In essence, it is harder for the minicomputer-turned-server vendors to differentiate themselves from the high-volume vendors of PC servers if the buying criteria are equally compelling for both sides.

PC LAN consolidation promises to be the next high growth sector in the shift to distributed computing and client/server systems, particularly in the midrange server arena (2-8 way SMP-enabled systems). At year-end 1993, the worldwide market for midrange servers (used as platforms

Buyers consolidating their PC LAN server environments have told Dataquest that their three prime motivations are: reduced administration costs; economies of scale; and security. We will now look at these purchasing criteria in detail.

Reduced administration costs: When a single large PC server or scalable superserver is less expensive to maintain, back up and upgrade than multiple dispersed PC (uniprocessor) desktop, deskside or tower configurations, it makes more sense to employ a

Oracle's Larry Ellison on AT&T WorldMark® Servers.

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systems consolidation alternative.

Economies of scale: With the emergence of fault detection, larger and higher-performance disk arrays, automatic fail-over and high availability, it is more cost-effective to upgrade one midrange-class server than to upgrade geographically dispersed entry-level PC servers.

Security: Companies are moving legacy applications, many of which are mission-critical, onto higher-end servers that support either a strong symmetric multiprocessing or clustering capability. Generic PC servers were not designed to support the availability and other uptime attributes associated with highly secure and reliable server systems.

By meeting the security requirements for legacy applications, vendors

of both superservers (2-4 way SMP) and midrange servers (4-16 way SMP) have extended the appeal of their products into a far greater number of environments.

RAID's impact on scalable servers

Dataquest expects that the PC server sector will continue to explode, based on three factors: 1) faster versions of the Pentium, PowerPC and Alpha AXP microprocessors; 2) continued increase in performance through scalable server platforms, and 3) the refinement and differentiation of technologies that were initially thought to be easily engineered, but are actually not. These technologies include RAID (Redundant Array of Inexpensive Disk) and PCI (Peripheral Component Interface).

Hardware-biased RAID was initially intended as a low-cost alternative to high availability on the PC LAN.

It is critical for users to understand the differences in RAID implementations if they are to make the correct choice of one server type over another. The biggest differences in the six levels (Level 0 through Level 6) pertain to availability in accessing information and optimization of certain types of applications. The network-centric applications that Dataquest believes are most optimized to meet the benefits of different RAID levels are listed in the chart on this page.

PCI: breakthrough bus architecture

PCI has been a breakthrough bus architecture, particularly in the PC uniprocessor server market, which is based on high-volume shipments of file, DBMS and print servers.

PCI is critical to distributed processing and client/server computing, especially now that the standard PC architecture can in some instances compete with RISC-based workstations and servers. The proliferation of PCI has been driven by the trend of scalable servers killing off host-centric computing. As a result, PCI will soon eclipse the EISA standard, particularly because of the benefits it brings to four areas:

1) Running client/server DBMS across a network (replacing EISA SCSI with PCI SCSI)

Types of RAID Technology

RAID TYPE	DESCRIPTION	TYPE OF APPLICATION
Level 0	Striping; No redundancy.	Applications requiring high performance for non-critical data.
Level 1	Shadowing. Both shadow set members need to be rewritten, degrading write performance.	System drives critical files.
Level 0+1	Striping plus shadowing together. Both shadow set members need to be written, degrading disk write performance.	Any critical response-time application.
Level 3	Striped data with dedicated parity drives. Drives are rotationally synchronized.	Large I/O request size applications such as imaging or CAD.
Level 5	Striped data and parity.	High request rate, read-intensive data look-up.
Level 6	Striped data and parity with intensive two parity drives.	High request rate, read-data look-up.

2) Addressing the developing market for video servers (PCI video adapters vs. EISA Ethernet)

3) Efficient use of the network (PCI cards are available that contain four

scalable data availability. Unix (and all its vendor-specific hybrids) is still the target operating system environment for re-hosting or re-architecting mainframe-centric applications onto a dis-

tions have grown tired of the requirement for three or four operating systems and the associated internal staffing costs involved in maintaining multiple operating systems.

Dataquest expects Novell to unveil a SuperNOS in the first half of 1996. Although vendors other than Novell have made commitments to eventually own the enterprise server, today, the most easily defensible choices when it comes to network operating systems for PC LAN consolidation are IBM LAN Server 4.0, Microsoft Windows NT 3.5 Server and NetWare 4.10.

End users have differing opinions of what features are critical in a robust server operating environment. Most buyer checklists focus on features and benefits such as performance, installation procedure, client support, administration and management integration, and communications and networking support. As a result, it seems that none of these three products has a compelling enough advantage to incite a user to rush to the migration altar.

Unix Then and Now

What It Was

- Unix was a fractured hybrid; vendor specific extensions keep it incompatible.

- Vendors push customers to replace PCs with Unix workstations, which are more powerful, have better user interfaces, are function-rich and network-extensible.

- Fewer shrink-wrapped applications exist; this becomes a catalyst for the in-house homegrown applications development environment.

- Limited connectivity options to the non-RISC (essentially PC) desktop.

What It's Become

- SPEC 1170 and CDE will unify Unix versions.

- Vendors regroup on claim, instead touting Unix as a server solution, conceding the client to DDS/Windows.

- Major vendors change "few applications" image. Such vendors, including Autodesk, Computer Associates, Oracle, Lotus and Novell, all offer strong Unix applications.

- Vendors and third parties start touting IPX and SPX protocol support, PC-to-NFS connectivity and better TCP/IP connectivity.

Source: Dataquest

Ethernets, all which can operate at full speeds without taxing the actual PCI bus itself).

4) Providing high-bandwidth support for network-based technologies that need more than 100Mbps. (EISA implementations have always been a bottleneck in this area; PCI handles this through performance and a well-constructed design.)

Unix still defensible ?

In the downsizing sector, Unix is currently the most favored operating system, primarily because its feature set sings when it comes to providing both scalable server performance and

tributed computing or client/server IT infrastructure. Now, as Unix tries to climb into the upsizing part of the transformation, particularly as the choice for projects involving PC LAN consolidation (where it goes head to head with Windows NT), it is important to contrast what Unix was and what it is now (see chart above).

As Unix starts to cross into "upsizing consolidation" territory, Dataquest believes that the three most popular (Intel-resident) Unix variants are SCO Unix, Sun Solaris and Novell UnixWare. The movement toward Unix will continue, because people in large and medium-sized IT installa-

Consolidate, consolidate

The proliferation of deskside uniprocessor-based servers on a PC LAN offers vendors a substantial revenue opportunity. But that same proliferation of servers requires them to package the highest number of functions into the least expensive price point (i.e., a strategy similar to what

Compaq did with its ProSignia). According to numbers from Dataquest, at year-end 1993 over $5.5 billion had been spent worldwide on PC servers.

Vendors of superservers (the PC LAN consolidators such as AT&T GIS, Digital, Hewlett-Packard and Tricord)

Methods For Migrating Mission-Critical Applications To Client/Server Platforms

Source: Dataquest

offer an alternative strategy, an architecture that melds the benefits of a PC server environment with the linear scalability and commercially robust features of minicomputer and main-frame-centric frameworks.

In fact, the recentralizing of entry-level deskside uniprocessors onto more scalable midrange (multiprocessor) servers — the crux behind PC LAN consolidation — will be the next high growth sector. At year-end 1993, midrange servers as LAN consolidators resulted in $6 billion in revenues worldwide, and Dataquest believes

that the enterprise consolidation portion of the upsizing market will grow to over $13 billion worldwide by 1998.
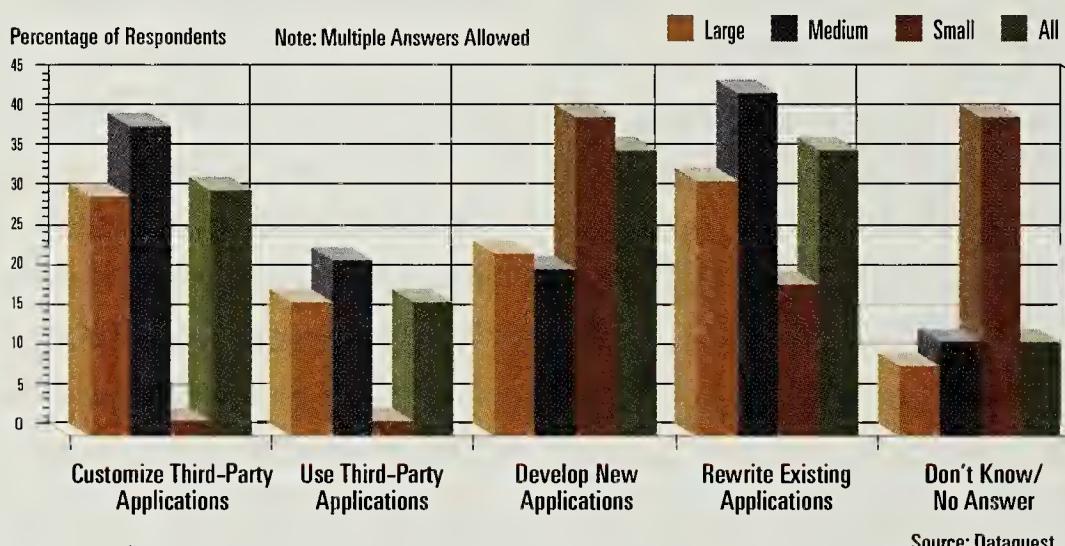
PC LAN consolidation offers potential for all server vendors because it will please those who head MIS by providing a manageable, highly available and reliable architecture and will please the users by offering them a cost-effective workgroup computing framework that will enable them to easily deploy LAN applications throughout the enterprise.

Checklist for server consolidation

Having objectives and guidelines will help a corporation approach consolidation more confidently. A corporation should develop a checklist of decision criteria, then place these criteria in one of three categories: critical, important or just nice to have. This

weighing by category should be agreed on by all levels of personnel — line manager, end user, system programmer and application programmer.

Most buyers considering LAN consolidation stick with a checklist that includes vendor-related factors such as: architectural reliability, breadth of choice of operating systems, linear scalability of the product, communications and networking, service and support, future product roadmap and competitive differentiation.

Swaying the bean counters

When the financial analysts responsible for a corporation's decision to consolidate review your capital expenditures, what functional benefits will you highlight?

One benefit that is likely to sway the financial watchdogs is a reduction in LAN administration costs, since it is less expensive to maintain, monitor and back up one large multiprocessing superserver than multiple high-end desktop or deskside servers.

Another cogent argument is the one concerning economies of scale. Now that superservers include features such as fault tolerance, larger disk arrays, automatic failover features and duplexed power supplies, it is more cost-effective to upgrade a superserver than to upgrade a group of dispersed PC desktop and deskside servers.

Also, although the security features

required when business-critical applications are moved onto a LAN are often designed into the multiprocessing superserver, that is not true of uniprocessor deskside and desktop servers. Offering mainframe features on a PC server remains the original appeal for employing superservers as LAN consolidators.

Before you begin to deploy your strategy for LAN consolidation, you should know when to stress operating gains versus operating expenses. The operating gains that a user can realize through LAN consolidation include increased revenues, displaced costs or avoided costs. Operating expenses for the new solution can include end-user training, IS staffing issues, facility expenses and ongoing maintenance.

However, financial justification may be based on a "soft" quantifica-

tion associated with a comparison of the system benefits and the costs of owning the solution. Soft quantification may include more tangible returns such as reducing costs, securing a competitive advantage or increasing productivity.

Despite all the financial justifications, the costs of application software development and systems software, once tallied, are usually the biggest obstacles in convincing management to move to client/server (Fig. 5).

The prevailing IT climate is one of turbulence and chaos. Vendors across the IT marketplace are trying to reinvent their core competencies and reshape their corporate identities to capitalize on the transformation to client/server architectures.

But with the chaos of this new market dynamic comes opportunity.

Opportunity in turn creates an entirely new set of problems, solutions and recommendations on how to separate vendor hype from profitable IT deployment.
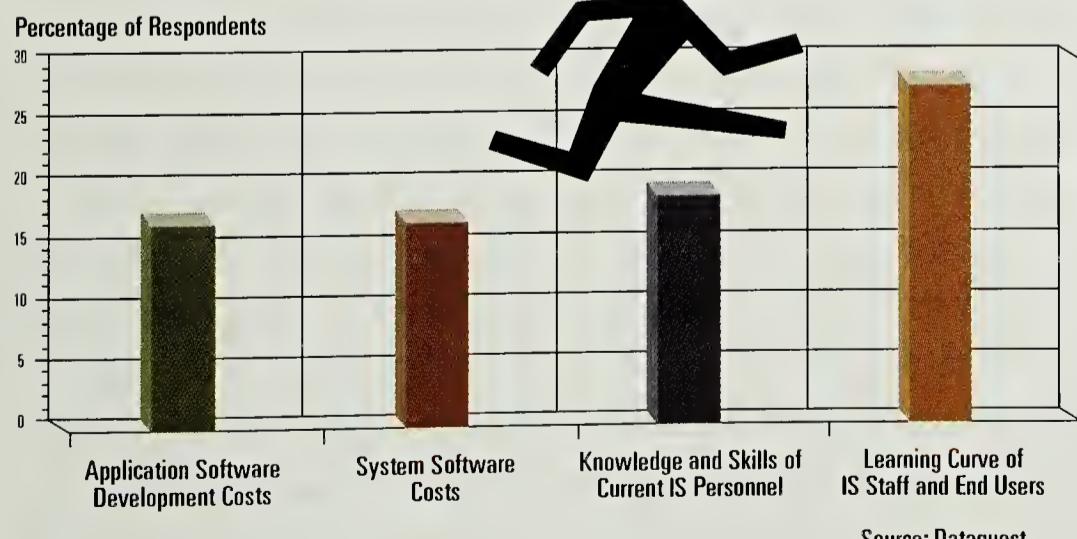
Vendors across the IT marketplace are trying to reinvent their core competencies and reshape their corporate identities to capitalize on the transformation to client/server architectures.

If you can find a vendor that claims it is not in some way delivering a product related to client/server computing, you will have stumbled upon an anomaly. With vendors sinking R&D costs into creating their own engineering and marketing identities, for the purpose of securing their own differentiated strategy, the power has shifted to those buyers who can offer testimonials of successful bleeding-edge client/server installations.

This can give corporate purchasers the upper hand at the negotiating table, with buyers able to challenge potential vendors to earn the right to do business with their companies, to back up the claims of their literature, and finally to offer a pilot program. These are some of the expectations of all the job functions that will take part in deploying client/server: the CIO, IS

FIGURE 5

Hurdles in Client/Server Transformation

Percentage of Respondents

| Application Software Development Costs | System Software Costs | Knowledge and Skills of Current IS Personnel | Learning Curve of IS Staff and End Users |

Source: Dataquest

manager, database administrator, network manager, systems programmer and applications programmer.

During the sales process, the question of fee vs. free will be played out in the pilot program. Every vendor hopes it can skip this stage. But if this stage is handled properly, a buyer can separate the client/server vendors capable of solving long-term problems from those that are merely tactical opportunists. A successful pilot turned deployment for a client/server vendor (hardware, software and services) can be worth sizeable revenues.

High stakes

Knowing how high the stakes are, clever buyers can negotiate with vendors and use the pilot as a test case for eventual deployment: securing equipment loaners, software specialists for hardware and software installation and integration testing (often free for up to 90 days), and the resources of a benchmark center to indicate how the system would handle simulated (or actual) network or user workloads.

The degree of fee vs. free is determined by how long the buyer can stretch out the pilot, and if the pilot is successful, what level of deployment with the specific vendor (i.e., revenue opportunity for the vendor) can be assured by the buyer.

Another factor swinging the pendulum toward the buyer is whether or not the company could be referenceable for other prospects, especially if the vendor is displacing a competitor's installation. Vendors of client/server solutions are seeking to build their "reference sell" capability, especially if they can find a customer that represents a client/server deployment success in a particular vertical market.

Before the migration

There are three stages in the full transformation to a client/server-based architecture: 1) the simple re-hosting of applications; 2) rearchitecting — bridging the old applications environment with the new; and 3) full business process reengineering (starting with workflow analysis and building a new business architecture). Each stage requires the same self-audit before taking the actual step toward migration. The issues in this self-audit include:

Don't try to migrate your applications suite all at once; select a few critical applications first, those that are the most profitable to solve. Profitability can be defined as where migrating applications avoids cost, reduces cost or improves profits.

Separate those applications that would gain a business advantage by being "client/servitized" vs. those that can afford to remain host-centric. In Dataquest's May, 1994 report on User Wants & Needs, 30% of the 200 IS professionals interviewed stated that their applications suite was still "mostly host-based."

In deploying a client/server architecture, the first step should be to develop a model for the business architecture). Only once that is done should you seek vendors to analyze the specific mix of technologies that comes closest to meeting your ideal. Be sure to match the technology architecture to fit the business architecture, not the other way around.

Client/server application development tools are too often purchased as the tail (the technology) that wags the dog (the business process). You must understand the entire business process before you can select the appropriate tool. Dataquest believes that the ideal definition of a business process should include the knowledge of the comprehensiveness required by the application logic, the level of network extensibility and the sophistication expected from the user interface and operating environments.

Manage the whole process

Many IS executives want to find a prime contractor or a single vendor that can manage the whole process in the move to client/server computing. This vendor must be steeped in global IT planning, which includes competencies in working with IS executives in applying management practices to define, create and follow through with

a technology plan; and matching and aligning the technology architecture to meet and drive the business's expectations. The prime consultant role requires the abilities to: audit and evaluate the existing environment; cre-

A sound client/server-based data warehousing topology can dramatically increase a company's sales, streamline inventory turns, affect the soft, often unaccountable human productivity aspects of business, and consequently, improve the overall operating margins.

ate a flexible alternative architecture; and develop a client/server transition plan for the most cost-efficient business architecture.

Refining the short-list of globally competent vendors requires diligence. Here are the "must-do" first steps:

1) Review the organizational competencies. Is the vendor fiscally sound? Can it provide installed reference accounts in the same vertical industry that demonstrate the same IT goals your organization will be striving for?

2) Determining product competencies. For enterprise-level downsizing projects, the technology architecture must be sound. A checklist should include a provision for a client/server architecture consisting of: high availability; server scalability (the degree of linear scalability is key); broad enterprise middleware offerings (equally flexible in empowering both client and server); sound interoperability and interconnect technology, for both LAN and WAN; architectural management tools (including all aspects of server management, network management and systems management); and a proven disaster recovery methodology.

3) Operational deployment vs. strategy competencies. This is the most important factor. Many vendors talk a good game, but can they actually deliver the solution on time? Talking to other customers of a vendor may be the best way to gain trust in a vendor.

Scrutinize the vendor

You should analyze the vendor's technology leadership, evaluate its ability to work with partners, and quantify its experience at each stage required in the client/server transformation. Does the vendor understand how to apply operational theories to an internal business environment? Can the vendor apply workable solutions to all elements of diversity, whether geographical, inter-group or inter-divisional, informational or specific to technological elements?

4) Pick the hardest applications for client/server transitioning. This is often the best way to shorten the list of vendors, and proof of concept is often the best test. For instance, database warehousing is an example of operational information in action in that it tests all elements of a computer architecture, focusing on the areas of a company that are profit-critical, such as sales and marketing, order processing, and customer service.

A sound client/server-based data warehousing topology can dramatically increase a company's sales, streamline inventory turns, affect the soft, often unaccountable human productivity aspects of the business, and consequently, improve the overall operating margins.

5) Service and support. The combination of ongoing operational support of the installed client/server topology and professional services capabilities is actually the most critical element in the long-term investment with a vendor partner.

Analysis of a vendor solution rarely takes into account how important service and support are. Because IT environments must be able to respond quickly to market, a vendor should, ideally, be able to:

1) support a multi-vendor environment,

2) offer planning and tactical capacities that not only find the problem but provide solutions to real business problems, and

3) apply state-of-the-art technology to the business architecture while anticipating emerging technologies.

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- Up to 6 LAN and 18 WAN connections
- Optional hot pluggable internal disk array w/RAID controller
- Optional internal uninterruptible power
- Optional AT&T LifeKeeper FRS
- Diagnostic subsystem

AT&T WorldMark 5100S
SMP Configuration

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- One processor subsystem per 5100S cabinet
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- 4 MB second-level cache per processor
- 32 MB Limited Address Range Cache per processor board
- 64 MB–4 GB ECC type memory per processor subsystem
- Up to 160 GB internal disk storage
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- Up to 7 LAN and 24 WAN connections
- Internal uninterruptible power
- Hot pluggable disk drives and fans
- Redundant power supplies
- Optional redundant battery backup
- Optional AT&T LifeKeeper Switchover FRS
- Fully upgradable to a 5100C (Cluster) or 5100M (MPP) configuration

AT&T WorldMark 5100C
Cluster Configuration

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- Upgradable to next generation Intel processor family (P6)
- 4 MB second-level cache per processor
- 32 MB Limited Address Range Cache per processor board
- 64 MB–4 GB ECC memory per processor subsystem
- 16 I/O slots per node; 32-bit bus width per slot
- Up to 7 LAN and 24 WAN connections per processor subsystem
- Internal uninterruptible power
- Hot pluggable disk drives and fans
- Redundant power supplies
- Optional redundant battery backup
- Automatic system recovery and automatic user and application switchover
- Administration Workstation Subsystem (AWS) allows a single operation view of the entire system

AT&T WorldMark 5100M
MPP Configuration

- Scalable BYNET fiber-based interconnect
- 1 or 2 processor subsystems per 5100M cabinet
- 4 to 32 133MHz Intel Pentium processors per processor subsystem
- Upgradable to next generation Intel processor family (P6)
- 4 MB second-level cache per processor
- 32 MB Limited Address Range Cache per processor board
- 64 MB–4 GB ECC memory per processor subsystem
- 16 I/O slots per processor subsystem; 32-bit bus width per slot
- Up to 7 LAN and 24 WAN connections per processor subsystem
- Internal uninterruptible power
- Hot pluggable disk drives and fans
- Redundant power supplies and battery backup
- Administration Workstation Subsystem (AWS) allows a single operation view of the entire system

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ROI: It's More Than Math

GO AHEAD, SHOW THE CFO PROJECTED INCREASES IN CUSTOMER RETENTION RATES AND DECREASES IN SALES SUPPORT COSTS INSTEAD OF ROI.

Quick, raise your hand if you've been asked to calculate ROI for a client/server project lately. You're not alone. Hordes of IS groups are struggling mightily to carefully crunch out the "right" number.

Too bad most have lost sight of the real question: "Should the company invest in this project?" Unfortunately, ROI — the catchall corporate yardstick — cannot measure client/server's value in a vacuum. Networked PCs and distributed databases do not return one cent by themselves.

How, then, do we decide whether to do a particular project? Start by exorcising the following four legacy funding assumptions:
- The CFO wants ROI, so we give him ROI.
- The best project will "win" when combatants slug it out for corporate dollars.
- It is (almost) impossible to stop a project once it's begun, so be careful what you start.
- Infrastructure costs should be buried because users don't understand them and won't fund them.

Hogwash.

CFOs speak business measures. In August, The Conference Board reported that 65% of the international companies studied were seeking ways to measure intangibles. (Customer satisfaction, innovation and quality of output are now viewed as better predictors of future corporate performance than traditional accounting measures.)

Client/server technology forms the underpinning of many re-engineering efforts aimed at improving tangible and intangible measures alike. So go ahead, show the CFO projected increases in customer retention rates and decreases in sales support costs instead of ROI.

Assume most projects have business value. It is impossible to predict with certainty which client/server efforts will produce singles and which will yield home runs without giving each project a turn at bat.

You'll need to take risks. Unlike in the mainframe world, client/server makes it easier and less expensive to prototype new business processes. Because the winners cannot be divined ahead of time, give each innovative idea a chance to succeed or fail on its own merit.

Keep technology efforts on a short leash. To avoid going broke funding a myriad of technology efforts, start small. Fund each project for three- to six-month intervals. At the end of each period, revisit the success criteria/business measures each team had to develop to get funding in the first place:
- Has there been progress?
- Is the team still committed to the effort?
- Are key users vocal in continued support?

If none of the above, redeploy people and gear to other efforts that show more promise.

Users understand the importance of infrastructure. When office space is constructed today, network cabling is laid right along with the plumbing and electrical wiring. While the average user may not know what a mail backbone is, he knows he can't work if E-mail goes down. A company must invest a steady stream of capital to keep the infrastructure healthy. The CIO should bring proposed infrastructure upgrades to the table for discussion like any other business initiative.

So stop chasing the Holy Grail of client/server ROI in a vacuum. Instead, spread your dollars around to experiment with many technology-enhanced business improvements at once. Keep a close eye on these projects, and demand concrete progress or pull the plug.

If you absolutely, positively have to have an ROI or the board of directors will have apoplexy, then make it the overall ROI for the improved business process. ◢

SUSAN COHEN

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The Don of Baan

A tranquil setting that would play well on a picture postcard is hardly where you'd expect to find a dynamic software company, but that's where Baan Co. resides. Its European headquarters is nestled in a forest near Ede, the Netherlands, occupying a former sanitarium.

Idyllic backdrops aside, Baan's been burning up the enterprise resource planning (ERP) software market. From a standing start three years ago, Baan's Triton ERP, consisting of manufacturing, distribution, finance, service, transportation and project management **INTERVIEW** modules, has vaulted into the Top 10 in U.S. sales, according to Plant-Wide Research Group in North Billerica, Mass. Baan counts The Boeing Co., Snap-On Tools Corp., Weyerhaeuser Co. and the U.S. operations of Mercedes-Benz among its prized domestic accounts.

An initial public offering (IPO) last March opened at $16 a share, rising to $35 a share by August and giving the company a market value of more than $1.5 billion. Not bad for a company that posted revenue of $123 million last year and is on a $185 million run rate this year.

What put Baan on the fast track? Its 13-year focus on open systems didn't hurt. Nor did its No. 2 status in Europe behind SAP AG or its domestic reseller deal with then manufacturing software leader Ask Computer Systems, Inc. Plus, its emphasis on flexible, fast implementations, its templates covering industry-specific "best business" practices and a wholehearted belief in third-party partnerships have kept Baan from reinventing the wheel.

Jan Baan, the energetic 49-year-old head of Baan and a former "financial engineer," controller and consultant, is a self-contained paradox. Calm and soft-spoken when discussing a charitable foundation funded through the IPO's proceeds, Baan becomes highly charged and rapid-fire when discussing concepts such as Money Resource Planning, or MRP III, as he calls it.

CSJ What do companies want in applications software?

BAAN In the past, [customers] would first re-do the process and then look for technology to implement the changes. Now, however, we see more companies seeking off-the-shelf solutions that will help — or maybe even force — them to re-engineer their processes.

That moves the battleground from specifying functionality to speeding up implementation. If a company can get its investment back in a year by quick implementation, it is concurrently getting the opportunity to make more money earlier. When you can reduce lead times by 50%, reduce inventory by 60%, increase customer service to 99%, the cost of the system is peanuts.

CSJ How do you achieve quick implementation?

BAAN Every industry has generic elements. When you buy a car, you accept much of the generic aspects of the vehicle and emphasize the things you can order to make it do what you want. It's the same with software. You have influence on the configuration up to a

BY TOM INGLESBY

Jan Baan
CEO, Baan Co.

HEADQUARTERS
Ede, the Netherlands

1995 REVENUE
$185 million *

CUSTOMERS
1,600 sites * *

*Analyst estimates for year ending
Dec. 31, 1995; North American
portion estimated at 30% of total.*

* *100 customer sites
in North America.*

point. To easily configure the software, we give the buyer templates that incorporate the rules and best business practices of an industry. These templates allow previous successful implementations to be replicated quickly at other customers or other sites.

More and more, we are forming alliances with our customers, consultants and systems integrators to define and build these templates on the best business practices and rules of the industries we serve, then incorporate them into our products. We are establishing competency centers with some of our customers and partners, for example, to demonstrate the template approach.

CSJ Does that differentiate Baan from competitors such as SAP and Oracle?

BAAN Those aren't our real competitors. When we go into a company, our competition is concrete and equipment, both of which vie

for the same funds as computer systems. It's harder to convince some managers to make the investment in software when they are more comfortable with machinery and buildings. Once we start to talk about software, we can show how we are less expensive and faster to implement than SAP and more flexible than Oracle since we can run on multiple databases, including Oracle's RDBMS.

CSJ One thing that makes Baan different from most companies is that you have set up a charitable organization, the Oikonomos Foundation, as a shareholder in Baan. What is its purpose?

BAAN "Oikonomos" is the Greek word for stewardship. It represents the way my brother Paul and I were taught to see our relationship to society: taking responsibility but, even more, doing something for others. The business has been very good to us, giving us a
Please turn to next page

good living, but there is a limit to the amount of money a person needs, so we set up the foundation to use the success of the company to do good for society. The foundation holds about 53% of the shares of the Baan Co., using the profits from that for its charitable activities.

CSJ Have you found differences between "best business practices" in Europe and those in the U.S.?

BAAN It doesn't matter what differences there were; it's changing into a worldwide approach. All major companies are worldwide enterprises, not U.S.-oriented or Europe-oriented. So our challenge has been to move to a worldwide perspective. We've done that by bringing together a management team from many different backgrounds and areas.

Our development takes place in the U.S., India and the Netherlands. We have a high percentage of our staff involved with research, and they are very efficient.

CSJ What role does client/server play in all this?

BAAN The market no longer respects proprietary systems; they want open client/server for its ease of use. Client/server is also a better tool for companies undergoing business process re-engineering. Re-engineering without client/server is "mission impossible."

[For example,] the Boeing Co. has been building airplanes in 10 to 16 months. They have to get that time down to six months to remain competitive. Their target is to coordinate 80 facilities ... synchronizing the ac-

tivities of all of them by the application of client/server technology throughout the supply chain. This will be a major effort to bring technology to the information sources and then bring information to all the places it is needed ... and it's needed everywhere in manufacturing.

CSJ Everywhere?

BAAN We have gone from megabytes to gigabytes to terabytes [of information], and that has caused a problem: We have too much information! The question must be, "Is the information relevant to you available to you?"

We can no longer follow the traditional approach of one, big integrated solution where all the data is in one place. In the future, many elements of information will be replicated and distributed instead of being in a centralized environment. This will let us get information to everyone, in every area of the company, at the right time, in the right amount.

CSJ What is the difference between data and information?

BAAN People talk about information as an output of data; I see information as an input for decisions.

CSJ How does that relate to your concept of MRP III?

BAAN One use of information is to simulate business processes. We can "prototype the business" to see what will happen if different approaches are used to improve the business.

With MRP [Material Requirements Planning] and MRP II [Manufacturing Resource Planning], we can use algorithms and data streams to

plan functions. With MRP III, we can use simulation as a tool to plan the complete business. It uses all the critical information and resources available ... in a constraint management approach to challenge the old ways of thinking. In the end, the results add up to a much better business.

CSJ What does Baan's future look like?

BAAN Our future is tied to the same issues modern manufacturing companies face: how to best partner with our customers and suppliers because we can't do everything ourselves.

We have alliances, for example, with Product Data Management (PDM), human resource and shop floor control software developers, all aimed at providing a tightly integrated ERP system that is highly scalable for companies of all sizes.

CSJ Is your growth rate going to cause an increase in staff levels?

BAAN A growing company such as ours can best serve its customers through partnering instead of adding to its own head count. By concentrating on the core product and letting our technology and service partners do the details, the customer benefits.

We think the best approach is the small, dedicated team. As things get more complex, it is easier to solve the problems with fewer people who are more involved in the total solution.

We expect extremely fast growth but growth that's under control. With 17 years of experience, we know better than to grow too fast, too big, too inflexible. That's not the Baan way. ∎

Inglesby is a freelance writer based in Phoenix.
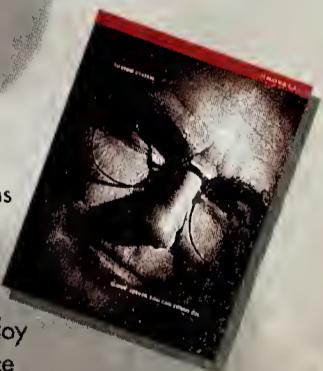
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JUDITH HURWITZ

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> ### THE 'INFORMATION ARCHITECT' CAN ACT AS A BRIDGE BETWEEN THE BUSINESS UNIT AND TECHNOLOGY.

Information technology organizations are clearly embarking on a major transition as they move to client/server. Many CIOs are looking at their personnel and wondering what new skills they will need to make the move.

The options used to be straightforward. You either hired people with good programming skills or found people with the right potential and trained them.

While organizations must clearly look for programming talent, the dimension of the skills required is changing. IT management should be looking for a new breed of staffer who has a combination of business and technology savvy.

Consider this scenario: A CIO at a major insurance company has a dilemma. Several of the company's mainstay developers and systems managers are retiring. At the same time, the CIO is beginning to plan for the future by radically changing the computing infrastructure of the organization.

Business units are mounting pressure to get better and more effective information systems. Who can fill this role? A C++ developer? Is it a database architect or the data management specialist who knows how to design a relational database schema? How many employees are needed, and where do you find them? A good set of questions. Unfortunately, the answers are complex.

The new profile of an IT professional will be much more complicated; he will therefore be even harder to find. And few universities are training people to fit the new set of requirements. This means that IT managers should begin training their own.

Who will this new professional be? In my view, we are looking for someone I'll call the "information general contractor" or "information architect." This is an individual who can act as a bridge between the business unit and the technology. He will have to understand both the legacy environments and the nature of the data and business rules that define these resources.

This person will also have to understand the structures of these information sources. In addition, the information architect will have to understand how the business is changing and how software and data need to be modified and built.

The profile of this individual is not unlike that of a sophisticated building contractor. Good contractors know the architecture of the structure they are working with. They understand how to integrate the old with the new. They also understand when there is something of value that should be preserved and when something should be gutted.

The information architect will have to know when a data source is critical to the business and should be preserved and when a data source should be phased out or rebuilt. Like good contractors, good information architects will know how to work with the organization that has contracted them for a project as well as with various subcontractors on the job.

As organizations begin to appreciate more and more the value of the information they have about their processes, current customers and potential customers, their need for an information architect will increase.

My advice is to start now. Look in your organizations and find those people who really understand the business and the data in the various data sources. These individuals are typically good communicators and good listeners. They know how to react to political situations without getting sucked in. They can translate vague requests into meaningful software requirements. Investing in these professionals will be money well spent. ∎

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Sales Force Automation

New client/server applications are relying on distributed databases to provide mobile sales reps with an integrated view of their relationships with customers

Accounting System

Accounts Receivable

Sales History

Manufacturing System

Inventory

Inventory levels are updated 👉 in the reference library

Orders are sent to accounts receivable, which updates sales histories (Note redundant data) 👉

Quote & Order System

Products and Prices

Contracts

Order Entry

Prospects and Customer Info

Company Names

Contact Names

Opportunities

Quotes Outstanding

Order Status

Call Reports

Sales History

Reference Library

Product Availability

Product Info

Competitor Info

Market Info

👉 Quotes are submitted to the customer database

Sales/Marketing System Shared by Marketing, Telemarketing, Technical Service, Customer Service, Regional Sales

👉 Can dial in for product/price and contract look-up to generate a quote

👉 In some cases, may take an order and submit it electronically

👉 Can dial in to exchange changes with the corporate database via synchronization

👉 Has a view-only link to reference information that is downloaded to the notebook

👉 Works mostly with a personal database, which is a subset of the corporate database and includes prospect/customer information and some key product, price and contract data

W. LOMAN

Designed, sold, delivered, serviced

The sales cycle doesn't stop with the sales rep. Neither should your mobile sales system.

Most companies that implement sales force automation systems aren't just in it for the money. The main payoff has much more to do with the value engendered, be it better quality information or data sharing.

After all, firms aren't just throwing a laptop and a contact manager at their field sales force anymore. If done right, these projects offer ways to synchronize the sales process with marketing, manufacturing, accounting and customer service.

The idea is for a sales representative to get a snapshot of his employer's entire customer relationship. This information brings the salesperson into the loop on things such as related sales efforts at other customer locations, when products were shipped, whether the customer has paid bills on time and whether there are service problems with previously purchased equipment.

Unlike earlier dial-in systems that depended on electronic mail and dial-in access to sales databases, newer systems use database synchronization to reconcile adds and changes from the field with the corporate database (see story page 50).

"Today, we look at the fit between the application used in the field and those applications used at corporate headquarters," explained Barton Goldenberg, president of Information Sales Marketing, Inc., a sales automation consulting company based in Washington.

But partly because there are so many owners of the data, these projects can be more complex, more time-consuming and more prone to political snares than nearly any other distributed computing project, said Peter A. Perera, president of The Perera Group, a consultancy in Andover, Mass. "Organizational issues are the real killers," he said.

"Technology alone is not going to solve this problem," agreed Jim Dickie, managing partner at Insight Technology Group, a Boulder, Colo., sales force automation research firm. "If you've got a lousy sales process, you're just going to do lousy and ineffective sales faster than you've ever done them before."

A key question is: Who owns the customer data? "Having a centralized customer management application pulls a bit of the control

INSIDE

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- Why there's no sales automation nirvana, PAGE 50.
- Expenditure breakdown, PAGE 47.

BY STEVE ALEXANDER

Onyx Customer Center 2.0
Onyx Software Corp., Bellevue, Wash.

Onyx's client/server application combines functions for contact management, sales opportunity management, customer service and product support. This release introduces Quality Assurance, which lets development staffers link, track and manage product change requests. The External Database Connectivity feature lets users view, add and modify data residing in Microsoft Corp. SQL Server-based systems.

Onyx Customer Center costs $30,000 for 10 users and is available from Onyx or qualified resellers.

STRENGTHS: Rich Bohn, president of The Denali Group in Issaquah, Wash., said Customer Center's graphical user interface (GUI) stands out. "The biggest impact of Customer Center is that it just looks designed by people who were steeped in good GUI Windows software design."

WEAKNESSES: One flaw is the product's network support. "Today, this isn't the best program if you have salespeople scattered all over the country," Bohn said. Onyx is beta-testing a new version, slated for year's end, that will address this problem.

Vantive Enterprise 4.0
The Vantive Corp., Mountain View, Calif.

Version 4.0 of Vantive's Enterprise, a suite of customer support and help desk applications, adds Vantive Sales, a sales and marketing module. Vantive Sales lets both internal and remote salespeople access and manage customer data stored on a relational database via dial-up links.

Vantive Enterprise, including Vantive Sales, is priced at $55,000 per module for 10 concurrent users.

STRENGTHS: According to Hugh Bishop, manager of emerging technology research at the Aberdeen Group in Boston, Vantive has done "an excellent job of architecting the product, especially in terms of performance, throughput and scalability."

WEAKNESSES: Vantive's challenge now is to build partnerships in the industry to leverage its product into the market leader, Bishop said. Christopher Lochhead, principal at consulting firm Always an Adventure in Toronto, added that while Vantive is well known for its support applications, it is still unproven in sales force automation.

Death of a Manual Sales Call
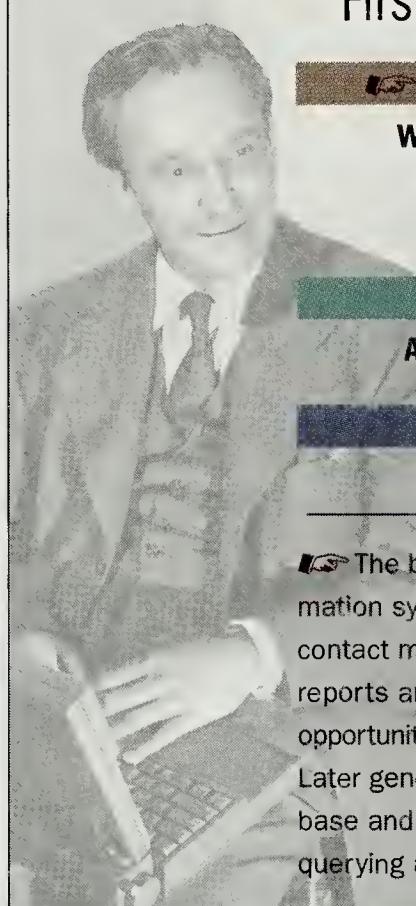
First generation	Second generation
☞ **FEATURES**	☞ **FEATURES**
Word processor Spreadsheet E-mail	Contact manager Expense reports
FOCUS	**FOCUS**
Administration	Administration
ADOPTION	**ADOPTION**
Early 1990s	Now
☞ The best sales force automation systems contain E-mail, contact management, expense reports and configuration and opportunity management features. Later generations build on this base and include features for querying and manipulating data.	☞ The next level features a contact manager that has scheduling and database features to speed up administrative functions, such as storing names and notes, and scheduling and reminder functions for making calls and appointments.

away from the department level and centralizes it. Some departments are not happy about that," said Neal Myrick, information systems manager at Visio Corp., a Seattle-based maker of shape-drawing business software.

Currently, Visio uses sales automation software from Onyx Software Corp. in Bellevue, Wash., for in-house sales. The Onyx single-database program runs on Microsoft Corp.'s SQL Server and, through custom-programmed links to accounting software, can draw out information such as order status.

In the future, field salespeople may also submit orders to the Onyx database, which would forward them to the accounting package.

Visio plans to extend the system to its 12-person field sales force using software slated to ship this fall. The salespeople will be able to update their customer database with corporate data and send changes through remote database synchronization.

Another concern is cost and implementation time. According to Perera, implementation can last 12 to 14 months for a 200- to 300-person sales team — enough time for people to lose heart about the system's benefits. And costs can run $15,000 to $20,000 per seat, including integration, customization, support and training, not to mention hardware, software and networking equipment.

BREAK IN THEIR STRIDE
But these obstacles are not stopping companies from building sales automation systems more intently than ever before. Corporations are betting plenty of money that new capabilities — database synchronization, fast modems, better remote computing technology — will help them cut costs, reap greater sales force productivity and, in some cases, grow revenue.

According to the Aberdeen Group in Boston, annual dollar revenues from software that more tightly integrates the enterprise with field sales are growing at more than 60% a year and are expected to reach $175 million this year, said Hugh Bishop, an Aberdeen analyst.

In fact, some say firms have to

Automating the sales force can have an immediate impact on productivity and customer service, which some companies expect to parlay into increased profits. First-, second- and third-generation systems focus on streamlining and organizing key administrative tasks for the salesperson. Future generations of sales force automation systems will concentrate on easing the actual selling.

Third generation	Fourth generation	Fifth generation	Sixth generation
☞ FEATURES	☞ FEATURES	☞ FEATURES	☞ FEATURES
Account manager Order entry	Configurator Opportunity manager	Enterprise selling Market/Field sales	Interenterprise selling Virtual sales groups
FOCUS	FOCUS	FOCUS	FOCUS
Administration	Sales	Sales	Sales
ADOPTION	ADOPTION	ADOPTION	ADOPTION
Now	1997	2005	2010

☞ Account manager features give a salesperson an indication of a project's progress and will usually contain customer service and accounting data.

☞ A configurator gives salespeople automatic solutions to such complex sales scenarios as selecting and integrating new equipment. For example, a salesperson can plug in a customer's specs and get the names of products and a layout within seconds.

☞ More sophisticated tools will allow salespeople to query and manage data in areas such as direct sales, telemarketing and TV, radio and print marketing.

Source: Gartner Group, Inc., Stamford, Conn.

SalesTrak 5.1
Aurum Software, Inc., Santa Clara, Calif.

Aurum's SalesTrak field sales management application promotes sharing of customer data among mobile users, branch offices and in-house users. Its dbSync technology lets even geographically dispersed users exchange data in real time. SalesTrak also has an option to support Xcellenet, Inc.'s RemoteWare communications tools.

SalesTrak 5.1 is priced at $19.95 for a 10-user client license, $15.95 for a 50-user license and $15,495 for a server license.
STRENGTHS: Christopher Lochhead, principal at consulting firm Always an Adventure in Toronto, said SalesTrak's strength lies in its database synchronization. "Field users can, on a real-time basis, upload and download their changes from their laptop," he said.
WEAKNESSES: David Hubanks, president of Salesource, Inc. in Chicago, said one potential downside is Aurum's "opportunity management-type selling process." This is a broader-based sales strategy than other vendors have implemented. "But Aurum is fairly flexible in bypassing certain methodologies," he added.

Scopus Extended Enterprise
Scopus Technology, Inc., Emeryville, Calif.

Companies can share sales and support applications with partners, outsourcers and field staffers using Scopus Extended Enterprise. The product comprises EE1 and EE2. Scopus EE1's RemoteTeam component improves remote access via E-mail; WorldTeam provides remote database replication; and SalesTeam 2.0 offers such integrated functions as telesales/telequalifying. Scopus EE2 is slated to ship by year's end.

RemoteTeam costs $8,995 for 50 users, plus $295 for each client supported. WorldTeam costs $19,995 per server. SalesTeam 2.0 is priced from $2,875 per concurrent user, depending on configuration. Pricing for Scopus EE2 is not yet available.
STRENGTHS: Scopus provides integration to remote users and support partners, said Hugh Bishop, manager of emerging technology research at Aberdeen Group in Boston.
WEAKNESSES: According to David Hubanks, president of Salesource, Inc. in Chicago, Scopus' package is "very limited compared with ones that are truly designed as sales force automation packages."

automate sales or lag. "In five years' time, a company that isn't doing sales this way won't be in business. And it may be in a lot less time than that," said Trevor Lee, director of marketing communications at CalComp, an Anaheim, Calif., manufacturer of printers that is knee-deep in a sales automation project of its own.

Indeed, MCI Telecommunications Corp. in Washington is already seeing results, and it's not even finished with its $100 million rollout yet. MCI is equipping 5,000 field sales and technical people with laptops and synchronized links to the corporate sales and customer service database. Sales software from Aurum Software, Inc. in Santa Clara, Calif., runs on a combined sales/service Oracle Corp. database and communicates with the laptops through remote access software from Xcellenet, Inc.

Field salespeople will submit orders and access product data, pricing information and customer spending projections and background data. The $100 million price tag includes the laptops, software, support, help desk and application development.

Since the rollout began in April, sales rep productivity is up 21%, and sales branches have reported a 23% increase in revenue, according to David Garrick, senior manager of field automation and communications at MCI's business sales and service division in Atlanta. MCI is projecting $450 million in additional revenue over an unspecified period of time, Garrick said.

LOFTY EXPECTATIONS
But for most companies, the goal goes way beyond increased revenue. "Our goals are improved communications, better sales force productivity, improved access to information from corporate and better information flow for things like sales lead tracking. And we hope it will help new reps get up to speed more quickly," said Pete Solvik, chief information officer at Cisco Systems, Inc., an enterprise network supplier in San

Jose, Calif. There are no projections that Cisco's new sales system, which uses sales automation software from Siebel Systems, Inc. in Menlo Park, Calif., will increase sales.

Cisco plans to roll out a system to 1,000 North American sales account executives, managers and systems engineers by next February to give them easier access to product and competitive information, more up-to-date pricing data, quick updates on sales leads and contacts and the ability to share information among different members of a sales team, Solvik said.

The Siebel sales database, an Oracle database running on a Microsoft Windows NT-based server, will be integrated into Cisco's main Oracle database for processing sales-related information.

In a subsequent version of the system, field salespeople will be given access to accounting and shipping databases that reveal customer billing and shipping status. Over the next year, Solvik wants every account rep's laptop computer to have all booking, billing and backlog information listed by customer.

WHERE THE PROBLEMS LIE
The difficulty may come when it's time for field salespeople to synchronize their laptop databases with the corporate one. "If you have large amounts of data to download and upload, the dial-in line speeds may be too slow. It will be a question of how much data you want to synchronize each time," Solvik said.

There are plenty of other potential technological glitches. For Garrick, the biggest problem has been controlling software customization. Because different groups within MCI have been anxious to write custom applications to run on the field sales laptops, IS has found itself blocking some potentially disastrous efforts.

For instance, all of MCI's laptops use Internet MCI, which relies on file transfer protocol (FTP). If an MCI department were to develop a remote application using another TCP/IP

stack, it would not be able to coexist with FTP, causing one of the two to become unusable.

And sales automation software itself is far from perfect. Perera said each sales automation vendor excels in one area, be it telemarketing, field sales, inside sales or customer support, but no vendor excels in all areas. The firm must decide which part of the sales cycle is most important.
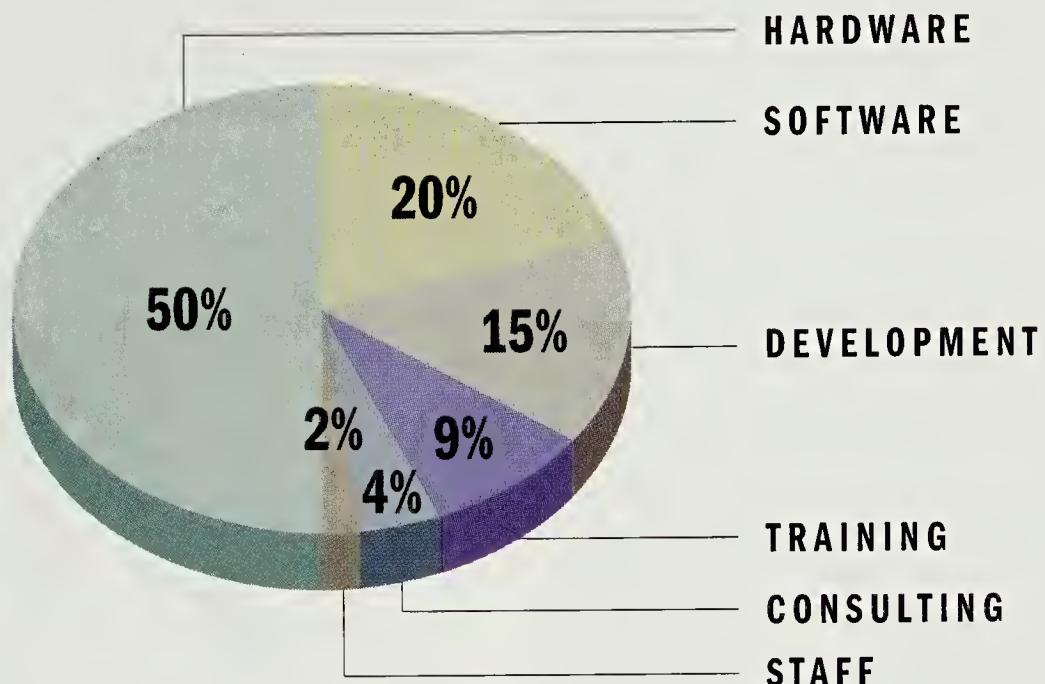
These types of complexities make off-the-shelf software a good starting point, Perera said. No vendor does it all, but as one company found out, growing your own software leads to increased complexity and costs. CalComp was going great guns with an internally developed legacy sales automation system. In the first 18 months after implementation, it saw a 190% improvement in marketing productivity, Lee said.

But the homegrown software re-

At what cost?

Over half the $6,400 per seat first-year cost of automating your sales cycle comes from hardware and software

HARDWARE

SOFTWARE

20%

50%

15% DEVELOPMENT

2%

4% 9%

TRAINING

CONSULTING

STAFF

Source: International Data Corp., Framingham, Mass.

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quired too many people to maintain and upgrade, so it will be replaced later this year by commercial field sales automation software from Scopus Technology, Inc. in Emeryville, Calif. The Scopus software uses a common Sybase, Inc. database for sales and support information, which allows field salespeople to both query sales information and communicate with the service department, just like the old software did.

"A system like this means a better return on marketing dollars spent," Lee said.

The sales/support database and an order entry database will also be linked. Homegrown software will provide database synchronization among all of the systems.

Twice a week, field salespeople will log on to the system, and all qualified sales leads will be downloaded to their laptop PCs. Plus, any changes in their sales lead files will be uploaded to the corporate database. That uploaded information will be used to make sales forecasts.

In the end, users and analysts caution against applying too much science to the sales process. "You shouldn't hit the salespeople over the head with the technology," Lee said.

Although CalComp's system is intended to make salespeople more accountable for following up sales leads, Lee said he is cautious about micromanaging their every move. That would conflict with the culture of independence among field salespeople, he said.

"The bottom line is, you'll kill yourself doing it, and all you'll be doing is saying to the sales rep, 'I don't trust you,'" Lee said. "You have to trust them to do a good job." ▧

Alexander is a Minneapolis-based journalist who reports on technology.

Synchronization Schizophrenia

Mr. Charles J. Tipton III
Development Engineer
Goodstone Tire Co.
Mail Stop 08J53
4 South Highway
Milwaukee, WI 53201

At first glance, there is nothing particularly interesting about merging and printing this person's name, title and address on a mailing label used in a direct marketing campaign for AirFloat Manufacturing Co.

But what about the personalized letter accompanying the brochure? The salesperson in the field knows "Charles Tipton" as "Red"; the customer service rep knows him as "Charlie"; and the regional sales office marketing coordinator knows him as "Chuck." The nickname that appears on the label depends on the database used to generate it. Or more likely, with users exchanging prospect and customer information, it will depend on the timing of information exchange among staffers.

Let's say the customer service rep changed the nickname on the host computer to "Charlie." When remote users connect to the host database, "Charlie" is downloaded and overwrites whatever was on their database.

The marketing coordinator notices the change and changes it back to "Chuck." Needless to say, a rather interesting cycle of changes can ensue. Hopefully, Charles J. Tipton III, who receives a lot of mail from Air-Float, will be humored by all this.

The fact is, when users edit and add information to their customer records, they need a robust way to exchange information changes. This is where database synchronization comes in.

Many sales force automation vendors use standard database engines that do not inherently provide a synchronization capability. The major exception is Lotus Development

The sad truth is that no one vendor satisfies all requirements for data synchronization

Corp.'s Notes, with its replication. Of course, Notes too falls short because it is not a robust, relational database.

Many software vendors have added certain levels of database synchronization and speak quite knowledgeably about how it works. But when you ask them to demonstrate it, the tap dancing begins. The sad truth is that no one currently satisfies all requirements for database synchronization, although some systems come quite close.

The following are some of the more important questions to ask a vendor about its database synchronization capability:

■ Are only changed fields exchanged during uploads and downloads (only the value that is changed in the salutation field is sent and not the entire record)?

■ Do users send a file of changed fields over phone lines at designated times, and are the changed files from all users then synchronized in a batch mode? Are two phone calls required — one for uploading and one for downloading? Or are changes made to individual fields in a record "tagged" at the time users change them? Then, when a telephone connection is made with the host computer where the synchronization process occurs, are the values in the tagged fields applied to the corresponding fields on the central database, and do users simultaneously receive changes made by others to the database?

■ Can uploading and downloading users' changes to the database occur on an unattended and automated basis where remote users have to plug in only their modems?

■ Can the software handle disruptions during phone transmissions so that corrupt data is not synchronized on the host and the files of changed data are not destroyed (so the letter is not addressed to "Farlie")?

■ Does the software create an audit trail so users can determine who made what changes to the database and when?

■ How does the software handle collisions when two or more users enter a different value to the same field in a record during the time between data transfers? ∎

Peter A. Perera is president of The Perera Group, an Andover, Mass., consultancy. He can be reached at (508) 470-2295.

Remote Users: Dialing for Dollars

Field salespeople at Sterling Software, Inc.'s electronic commerce group in Columbus, Ohio, could in the past dial in to the home office for data. But their access was limited to the sales accounts they handled.

No more. Sterling is rolling out a new sales automation system using software from The Vantive Corp. in Santa Clara, Calif., that consolidates seven databases into one Sybase database on a Unix server. It will be shared by the sales, customer service, accounting and marketing departments.

Later this year, about 30 field salespeople will be able to tap into that database by dialing the Unix server, synchronizing laptop and corporate databases and obtaining virtually any information they need about a customer's dealings with the Sterling group.

"The big pain in our company has been that we didn't have access to the information we needed," said Chris Clothier, a project leader for the group's network service division. "Now there is one source of information rather than seven disparate sources, and no one has to truck around the building looking for information for a customer."

The new software offers people from different departments different screen views of the same data. For example, a sales representative will see price quotes and information for use in sales proposals; an accountant will see what was sold at what price and whether a customer is paying its bills; a customer service representative will see a list of a customer's purchases and technical problems and learn whether the customer is eligible for customer service as a result of paying its bills.

Sterling expects to reduce costs by cutting the time it takes salespeople to resolve issues such as billing disputes over electronic data interchange service, Clothier said. The Vantive software also promises to make salespeople appear more knowledgeable about the details of their customers' accounts.

But Sterling is hesitant to predict that the new software will boost sales. "You never want to say that just because you give people more time, they will increase their sales. They could spend the time smoking cigarettes and drinking coffee," Clothier said.

Chris Clothier is glad to have central data access

PHOTOGRAPHY BY TED RICE

Replication mania

KEEPING DATABASES IN SYNC REMAINS A CHORE, BUT USERS FIND REPLICATION WORTH THE EFFORT

the data was there in a relational database — more than most mortals would ever want to know about heart disease. It was 1.6G bytes of information on 92,000 patients and half a million procedures. More information poured in constantly from the clinicians and technicians at Duke University's Medical Center in Durham, N.C. With the data, researchers could create prognostic models to help indicate the future course of various diseases and, in turn, save lives.

The trouble was, the researchers' lengthy statistical queries locked the data tables, preventing clinicians from updating patient records. Accessing patient data might ultimately save humans, but "it killed the database," said Dr. Donald Fortin, director of data management for the cardiovascular diseases data bank.

To spare the transactional system (and parry threats from distressed users), Fortin chose to clone a copy of the database for research-

ers and synchronize updates every five minutes or so. After testing and rejecting Sybase, Inc.'s Replication Server as too expensive and difficult, he switched earlier this year from Sybase to the new built-in replication technology in a late beta version of Microsoft Corp.'s SQL Server 6.0. Now researchers can query the clone to their hearts' content.

Of course, the building process wasn't trouble-free. SQL Server's graphical administration interface made setup easy, but to automate the research application as completely as users wanted, Fortin's programmers had to spend six months and roughly $50,000 worth of wage time writing and debugging tens of thousands of lines of code to translate between SQL Server and the researchers' statistical software.

Like Duke, more companies are finding themselves willing to endure the trials of database replication to

Please turn to next page

BY LYNDA RADOSEVICH

meet the growing demand for immediate and timely information. The numbers are certainly not huge: Gartner Group, Inc. in Stamford, Conn., estimates current replication users in the hundreds, according to database analyst Donald Feinberg.

But the benefits, pioneering users say, are compelling. Superior National Insurance, Inc. in Calabasas, Calif., for instance, uses Sybase's Replication Server engine to provide company underwriters with near-instant policy analyses, allowing them to offer low-margin but still profitable policies.

The Sybase engine feeds business information, such as workers' compensation rates and customer profiles, from on-line systems to a 4G-byte executive information system (EIS). The EIS is only five seconds or so behind the on-line system, according to Felice Smith, assistant vice president of MIS. After just one year of using the system, underwriters have won enough extra business due to competitive pricing to pay for two years' worth of the system's costs, Smith said.

Packaged replication capabilities, which are increasingly found in database vendors' systems today, are at least starting to help users with the difficulties of implementation. These systems copy and update sets of data stored in different places and reconcile conflicts when the same pieces of data are updated differently (see box at right).

MISSING FEATURES

But even using these capabilities, Fortin and Smith would be the first to say it takes a lot of work to hit the replication jackpot. First, users must face the challenges typical of any emerging technology — namely, limited features and a shortage of expertise. Depending on the database brand, needed features include the following:

■ **Better methods for reconciling data conflicts.** None of the packages have mechanisms to handle circular repli-

cation schemes, in which server A updates server B, which updates server C. As a result, old data can end up overwriting new data.

■ **The ability to work with multiple architectures.** For example, as of press time, Microsoft's SQL Server can replicate only with other SQL Server databases.

■ **Better administration and development tools.** Sybase's Replication Serv-

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ten-second definitions

There are two basic types of replication technology:

ASYNCHRONOUS REPLICATION:

This is what many people mean when they use the term "replication" — tracking updates and then sharing them with other systems at set intervals. If a system is unavailable, the replication program continues to track updates and synchronizes the systems when connections are available. Asynchronous replication can happen when a database event triggers an update from the source to the remote site or when a remote site pulls updates from a central site. The first method is built for transaction applications in which data must be pushed out to remote sites as soon as possible. The second is aimed at decision support applications.

SYNCHRONOUS REPLICATION:

This type of replication uses two-phase commit, a technique to ensure that a "master" system successfully completes a transaction update to all "slave" systems in a distributed database environment. If a connection to another system is down, the update is rejected. This method ensures that data will not get out of sync. However, if there are more than two databases and the commit cycle fails, network traffic is heavy and recoveries become complicated.

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er, Oracle Corp.'s Oracle and Informix Software, Inc.'s Informix, for instance, don't track the replicated data. "One of the negating factors in the whole replication area is that major, successful replicated databases can still require an unusual amount of administrative support," warned Wayne Kernochan, director of commercial systems research at Aberdeen Group in Boston.

■ **Two-way replication.** IBM, for example, sends data only in one direction. Updates cannot be sent back to the source.

Some of the more subtle lessons, of course, are learned the hard way: through experience. "We just jumped in and installed [Sybase's Replication Server] and wasted a lot of time because we didn't have a good grasp of what it does," Smith said.

With four years' experience successfully using Sybase in complex applications, Smith figured she and her staff could skip the weeklong course Sybase offers for Replication Server users. But she recommends that users do otherwise: "The benefit is not to learn how to install it but to get the conceptual ideas and learn the application possibilities."

BETTER THINK AHEAD

Indeed, you can't just lob replication schemes onto existing applications. Rather, applications should be designed from the ground up with replication in mind.

"If I'm doing transactional replication with the ability to update the data in every location, I've got to think about that when I'm designing the application. Otherwise, I can get myself out of sync," said Bobby Cameron, an analyst at Forrester Research, Inc. in Cambridge, Mass. (For more on data synchronization, see column on page 50.)

Relational databases weren't designed with data synchronization in mind, so users have to build in steps during the design phase, Cameron said. For instance, you wouldn't give local servers the authority to debit a corporate warehouse.

The fact is, replicated applications are not expected to become mainstream for a couple of years. After all, this is new technology. Sybase was first to market, and that was only two years ago. Oracle's replication software is less than a year old, while Microsoft just came out with replication capabilities this summer.

Meanwhile, database vendors are burning the midnight oil to fix their replication problems. Oracle, for instance, is building tools that will automatically script a business task: If a user has one big central server today and tomorrow wants to break that server into an inventory server for each warehouse location, the user can write a business statement into the tool, and the tool will set up the replication logic to make it happen.

Microsoft is working on Open Database Connectivity (ODBC) drivers that will permit replication between SQL Server and other ODBC-compliant databases. And Sybase recently launched a new consulting service expressly for helping customers set up replication-based applications (for a price, of course).

So why bother with vendors' replication schemes now? For Duke University, it was either that or write code from scratch — not an appealing proposition. For London Life Insurance Co., there was just no alternative to control costs and provide improved sales information to a 2,800-person sales force.

At the London, Ontario, workers'

compensation insurance company, data is replicated between Sybase database servers in 150 branch offices and 60G-byte DB2 and IMS databases on an IBM mainframe at headquarters via a Sybase gateway. The goal is to improve data access on local servers for Windows users, said John Thompson, director of information resource management.

Having up-to-date information locally prevents the salespeople from having to dial in to the central office. This improves response time, reduces network traffic and costs and cuts mainframe cycles and horsepower needs at the central office, Thompson said.

So like many classic client/server ventures, implementing replication is no cakewalk, but the returns may just make it worthwhile. ▨

Radosevich is a freelance writer based in Belmont, Mass.

Better RAD Than Wrong

BY ELIZABETH HEICHLER

RAD gets a bad rap in some quarters. Rapid application development (RAD), with tools such as PowerBuilder or Visual Basic that make short work of user interface design, is no faster than prototyping, some skeptics say. It's simply a quick way to build hard-to-maintain programs that offer limited functionality.

But some firms are making strategic gains with RAD. They say the key to success is investing time and effort in laying the groundwork on which RAD can then build.

Take Kennametal, Inc. The Latrobe, Pa.-based manufacturer of metal-cutting tools has focused client/server RAD efforts where it can gain a key strategic edge: its field sales force. By frequently updating custom software that runs on mobile computers, Kennametal is ensuring salespeople have fingertip access to detailed customer information, as well as market-specific sales analysis tools, according to Michael Taccino, information systems project leader.

Applications development with Microsoft Corp.'s Visual Basic can take eight to 15 weeks, he said. That quick pace is important: "We try to stay ahead of what the sales force needs," Taccino said. In particular, the systems give the sales force an edge in customer service, helping staffers analyze and quickly meet the rapidly changing needs of their customers in manufacturing.

But speed isn't everything. The background story of Kennametal's success concerns a nine-month ef-

The key to success is investing time and effort in laying the groundwork

fort to develop a solid client/server infrastructure. The system comprises mobile PCs, a TCP/IP network, an Oracle Corp. database server and a DB2 database that accepts live queries when necessary. Middleware tools from Open Environment Corp. provide Open Software Foundation's Distributed Computing Environment-based connectivity between the front and back ends.

Setting up the client/server infrastructure also meant that sales and customer data from the mainframe DB2 database was copied to the Oracle system: "We did a lot of database architecting, structuring and analysis," Taccino said.

Indeed, setting up the back-end database properly may be the key component in building a RAD infrastructure. "RAD allows you to build a relatively sophisticated front end

quickly, but if you don't have the right infrastructure to support that front end, it doesn't do any good," said Charles Osborn, assistant professor for IS at Babson College in Babson Park, Mass.

Osborn defines the right infrastructure as a good understanding of — and access to — both data and data structures. "The real risk lies in not doing a careful job of understanding the business implications of your data," Osborn said.

A heritage of the transaction-oriented applications of the past few decades could be, for example, that an insurance company's data structure understands only scattered insurance policy numbers, not the customer who may hold several of its policies. "Companies that have carefully thought through their data infrastructure are best able to take advantage of RAD," Osborn added.

The good news for users of unsophisticated RAD tools, such as Visual Basic and Powersoft Corp.'s PowerBuilder, is that more add-on tools are addressing this issue. Powersoft's acquisition of data modeling vendor SDP Technologies, Inc. is resulting in an integrated facility for database modeling, analysis and reverse-engineering. Vendors are offering such tools for Visual Basic, too.

Meanwhile, developers such as Taccino aren't losing sleep over application maintainability — or lack thereof. "We don't anticipate them being around for more than three years," he said. "We're not trying to do things that will last 10 years." ◪

Heichler is managing editor at IDG News Service in Boston.

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The Making of a Proper Project Manager

Turning technoids into techno-translators

BY WILLIE SCHATZ

When Craig Betteridge, an applications manager at Norcal Waste Systems, Inc. in San Francisco, had to pick a project manager to craft an application to fulfill a new state regulatory recycling requirement, he chose Mary Costanzo. She was the rawest of rookies. So how did Betteridge know Costanzo was the right woman for the job?

He didn't. "I'd like to say I saw greatness in Mary, but I simply had a job to get done," he said.

In today's fast-paced business world, blind choices such as Betteridge's probably happen every day. But even if you really make a study of it, spotting a good project manager from a pool of programmers for something as political and complex as client/server is not an easy task.

"It's akin to selecting employees," said William Durbin, director of information systems at Norcal. "You look at their background, their knowledge, their ability to communicate, their skill set and their overall strengths and weaknesses."

Durbin suggested five key qualities for a project manager (see box) but above all emphasized communication, including the ability to confront, compromise, empathize and even joke around. "If you can't deal with people, the project will fail," he said. "In my lifetime, that's been true every time."

Sales capabilities — that's the key trait for project managers, according to Dan O'Keefe, himself a sales engineer and project manager at Mobile Software, Inc. in Boston, which sells executive information systems software.

In his previous life as a techie, O'Keefe confessed, he was overly arrogant, even for a breed that thinks

WHO MEASURES UP?

Here are four key qualities that one IS director looks for when choosing a project manager:

1. THE ABILITY TO COMMUNICATE AND WORK WITH PEOPLE. That means compromising, empathizing, cajoling and confronting. Without this skill, the person and the project will fail.

2. ORGANIZATIONAL SKILLS. The person will be juggling senior manager requirements with technology demands.

3. TIME MANAGEMENT. Programmers are accustomed to hands-on tasks with short deadlines. Project managers need to get used to longer term, more analytical work.

4. THE ABILITY TO MANAGE ANY PROJECT ANYTIME, EVEN WITHOUT THE TECHNICAL KNOWLEDGE. This is possible if the person knows management techniques, such as "management by objectives" and the "waterfall project plan."

extremely highly of itself.

But O'Keefe experienced another side of life when he seized the opportunity to become a salesman. He didn't know it at the time, but the lessons he learned during his two-year sales stint at Pilot Software, Inc. in Cambridge, Mass., gave him the tools he needed to become a successful project manager.

"Every project manager has to sell his project to every aspect of the corporation," O'Keefe warned. "Without that, there's no chance the project will succeed."

In fact, O'Keefe said, "I think companies should turn every techie into a project manager because techies have to understand the business side."

But even if you look for specific traits, most contend that it often requires a serious leap of faith to put a project's fate in the often untested hands of a techie. And that can make the turf somewhat treacherous.

"Even though people didn't say it, I know they were thinking that the company was wasting its time," Betteridge said of his project manager choice. "They'd see that Mary wasn't producing anything tangible. But I tried not to think about that."

The fact was, Costanzo didn't know the correct methodology for managing a project, he said. She had no clue about the state's compliance rules for recycling, and she was totally unfamiliar with management tools, skills and procedures.

So Betteridge spent many hours

Continued from page 59

coaching Costanzo through the rigors of creating a shell document for the recycling program while simultaneously sharing his management techniques.

The lessons included a traditional management-by-objectives course, which focused on producing deliverables. That course was followed by the "waterfall project plan": needs analysis, functional specifications, development, testing, user involvement and user acceptance. Bette-

PEERLESS PROJECT MANAGERS
Applied Business Technology is announcing a call for nominations for its Second Annual Project Leadership Awards, which are aimed at increasing awareness of the important role project managers play. Nominations are due by Nov. 30. For more information, contact: ABT Project Leadership Award, (800) 477-6532.

ridge finished with a crash course in rapid application development.

"I put her through some serious wind sprints," he said. "I really stressed her."

But the gain was clearly worth the pain. Costanzo finished the project on time and under budget. The program was implemented last March and hasn't missed a nanosecond. ∎

Schatz is a freelance writer based in Washington.

A TECHIE MAKES A TRANSITION

Mary Costanzo spent four years as a programmer/analyst at Norcal Waste Systems "doing the same thing every day, working on financial applications," she said. That ended when she was chosen to head up Norcal's new client/server application to manage regulatory recycling.

Computerworld Client/Server Journal interviewed the techie-turned-project manager to find out how the change has made a difference in her life.

CSJ What was the hardest part about the transition to project manager?

COSTANZO I questioned myself all the time. I was always worried about missing deadlines, and I was constantly afraid I'd forgotten something. I had to do lots of analysis on a PC, and I hadn't done much of that because I was much more a programmer than an analyst. And now I had to see the whole picture.

CSJ Did you like the view?

COSTANZO Eventually. The scariest part was when I had to present the project to the users and the programming staff. I kept thinking they were going to hate it. I was afraid of failing in front of my peers.

But then I realized they were there to judge the product, not to judge me. After that, I wasn't scared anymore. And we implemented the product last March.

CSJ So would you rather be an "analyst/programmer" or a "programmer/analyst"?

COSTANZO [In my former job], I liked seeing the concrete results of my work. I liked the feedback from

Mary Costanzo's job is now 75% analysis and 25% programming

users. And I enjoyed the heads-down programming and having my fingers in the software pie.

[Now] I'm no longer just a little programmer in my little cubicle. My job now is 75% analysis and 25% programming. I like it much better.

It's really helped me personally, too. I'm much more confident. I'm able to see the big picture rather than just worrying about the task at hand. And people can see my value to the company only six months after the walk-through.

CSJ What is the most difficult part of managing other people?

COSTANZO Not doing the [programming] changes myself. I have to keep up with things returned to me for testing, and I'm actually giving directions to someone else.

CSJ How do you manage the business side of your projects?

COSTANZO That is difficult. I had to be very careful not to get too technical too quickly. I had to really concentrate on what the business side wanted to accomplish. Otherwise, I would have written the program right away.

Coming in the November issue of Computerworld Client/Server Journal...

November Issue

Cover Story: The Shakeout in Application Development

What's in store for users and vendors as the application development market changes and consolidates.

Vertical Market Focus: Brokerages

A look at how brokerages and investment banks are using client/server technology to manage their risks, and deploying this technology to help develop and manage new derivatives products.

Product Focus: Application Development Tools

Our Firing Line feature takes a look at Forte 2.0.

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A former Cobol programmer relates the process of switching to a career in Notes development/administration.

COMPUTERWORLD CLIENT/SERVER JOURNAL

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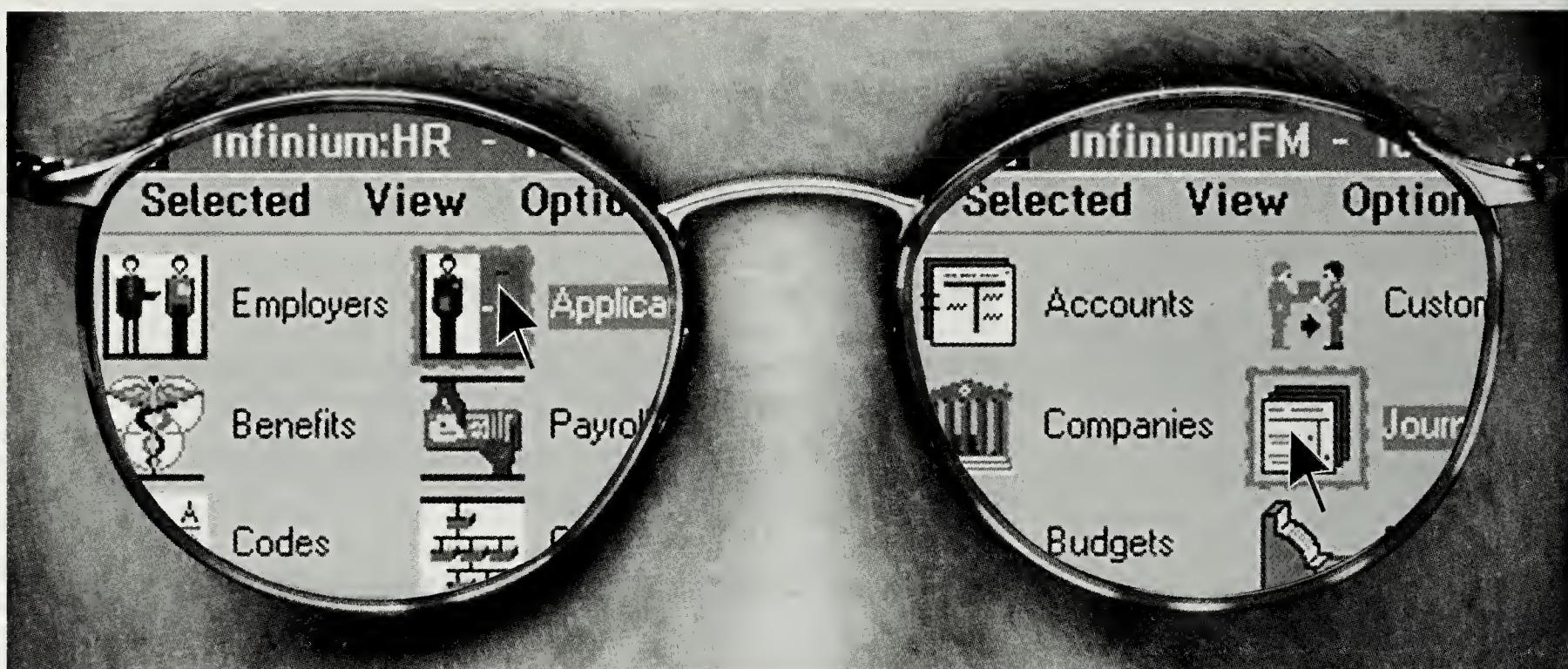
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(Software 2000)

Endangered Species: Project Methodologies

*Surfeit of tools and insufficient time
cause poor project performance*

BY PRISCILLA TATE

Whatever happened to the term "project life cycle?" Like the phenomenon itself, the term has been truncated. We refer to "cycle time" — implying a fluid process that occurs without human intervention — to avoid the association with mainframe (read "slow") application development.

A recent survey of 500 information technology managers conducted by the Technology Managers Forum reinforced two constants of distributed computing: Applications that affect the way people do their jobs require a lot of planning, and in the case of client/server, information systems planning is on the rocks.

The survey afforded an opportunity to ask: "What one element of a past or present client/server project would you do differently if you had the chance?"

By far the most common admonition of hindsight was to "allow more time" or "plan better." From the responses, you get a clear picture of what a nightmare client/server project management is.

"We should have put much more time in up front to set standards and to coordinate implementations; too many issues were resolved on the fly," one respondent put it. "It was like trying to change a tire while we were driving 70 miles per hour," another said.

If technology managers repeatedly tell us they needed more time to plan the implementation and that they should have used fewer tools, hired more outside consultants and allowed more time for training users and retraining programmers, what

does it tell us about client/server deployment? It tells us that project planning was inadequate, that estimates were out of sync with actuality and that each client/server project became a new adventure.

Instead of following a standard outline for conducting projects, organizations have been relying on technical wizardry to get the job done. This leads to project management burnout. Project management is not about deadlines; it is about tracking, controlling and improving the process of change.

Lack of time may be the excuse, but why isn't an initiative such as re-engineering the business planned more carefully? Is it because organizations compelled to re-engineer their business processes don't have the luxury of time? Are competitive pressures so intense that project management succumbs in the triage of crisis management?

To be sure, the re-engineering process itself is part of the problem. Once you start fiddling with the building blocks of your business, projects take on a life of their own.

Nevertheless, IS managers should take a hard look at their project management methodologies. A

project plan is constructed along three dimensions: time, resources and scope. At least one of these dimensions must be fixed in order to construct a working model. A client/server project may be a moving target, but the component of time must be brought into a more realistic relationship with the project's scope and the resources available.

The relationship among these variables is not linear. Adding more people to a project is not a solution — it's like having too many cooks in the kitchen.

In search of excellence, perhaps we all have unrealistic expectations of the power of technology and the human dynamics of change. No matter how rapidly business requirements shift and technologies improve, some steps in project management cannot be collapsed together. To keep a client/server project in sync with reality, learn from those who have gone before. Put your foot down on the side of a realistic timetable. Projects spiral through stages of analysis, design, testing and implementation.

Prevailing assumptions about how long application development and deployment are supposed to take are way off base. It may be true that "change" changes things. It is also true that "time" takes time. ◢

Tate is executive director at the Technology Managers Forum in New York. The client/server survey was distributed to members and tabulated by IDG Research in May and June of this year. To request copies of the report, call (212) 787-1122 or send E-mail to 352-1748@mcimail.com.

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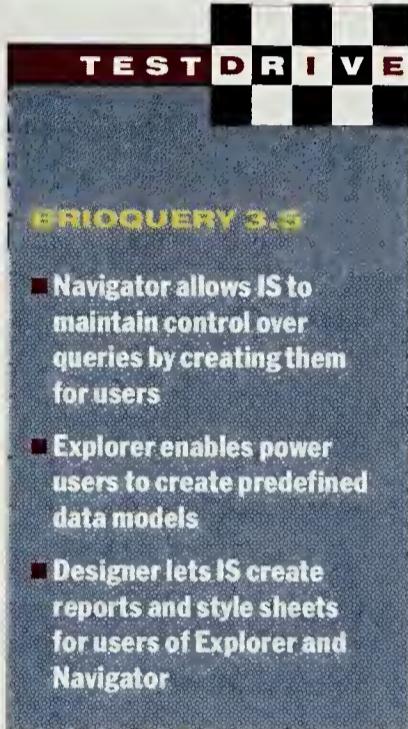# WHAT'S NEW

A ROUNDUP OF NEW PRODUCTS AND REVIEWS

Brio Offers Trio of Query Tools

■ *By Christopher Lindquist*

Getting data onto users' desktops can be no easy feat. Gone are the days when users simply submitted a request to the information systems group and waited for the data, only to follow up with another request for the data they really wanted.

Now, users want to retrieve data themselves — reorganizing, drilling down and reconfiguring in whatever way best suits their needs. Unfortunately, handing even the most adept users a SQL manual is a recipe for disaster. Building a front-end application with a development tool such as Microsoft Corp.'s Visual Basic or Powersoft Corp.'s PowerBuilder can be more trouble than it's worth. That's where query tools come in.

BrioQuery 3.5 from Mountain View, Calif.-based Brio Technology, Inc. provides users and IS with a straight-

TEST DRIVE

BRIOQUERY 3.5

- Navigator allows IS to maintain control over queries by creating them for users
- Explorer enables power users to create predefined data models
- Designer lets IS create reports and style sheets for users of Explorer and Navigator

forward way to access data. Designed primarily for data warehouses, BrioQuery offers a flexible set of tools that lets users define queries, retrieve and manipulate data and create reports.

BrioQuery is available in three versions:

■ Navigator, priced at $595, lets users select queries from lists of predefined data models

designed by IS. The least flexible of the three tools, it lets IS maintain control over what kinds of queries users make.

■ Explorer is for more knowledgeable users in businesses with well-organized data. Power users can use Explorer, which costs $595, both to use predefined data models and to create their own.

■ Designer, while similar to the previous two in querying capabilities, also allows IS to create predefined data models, queries, reports and style sheets that can be distributed to users of both the Navigator and Explorer versions. These predefined items can set limits. Designer costs $2,595.

Both Explorer and Designer let the user create data models and queries using a simple drag-and-drop interface. Joins are performed in much the same way: by simply dragging an item from one table onto another item in a different table.

Simple enough, but BrioQuery 3.5 gets most interesting after the query is made. Users can easily format, reconfigure and examine the resulting data by clicking the right mouse button to bring up "speed menus." Users can set value limits to eliminate unnecessary data.

Data drill-down is also supported, which lets users easily get at the data behind the data. With the "pivot" tool, users

can modify reports by simply dragging query columns into an "outliner" to create row labels, column labels and data.

Users can then compile the resulting information into a report that can be formatted with a style sheet defining text type, layout and colors. If the available reporting tools are insufficient (BrioQuery, for example, includes no charting tools), the data can be exported to standard spreadsheets and reporting packages.

Perhaps BrioQuery's biggest drawback is that it offers no facility to update data. If you need to make changes, you must use another package. However, Brio said it is considering adding this feature in a later release.

Regardless, for businesses looking for an easy tool to give users access to data with little IS involvement, BrioQuery 3.5 should be a top candidate. BrioQuery 3.5 is available in Windows, Macintosh and Unix versions, allowing users on different systems to access the same tool.

BrioQuery 3.5 supports numerous databases, including native support for Oracle Corp.'s Oracle, Sybase, Inc.'s Sybase, Red Brick Systems' Warehouse and Microsoft's SQL Server.

Brio Technology, (800) 879-2746. ◪

Lindquist is the technical editor of Electronic Entertainment *magazine.*

			1993		1994	
			Revenue	%	Revenue	%
Computer	Home Series	Mouse	$23.233	6%	$21.956	5%
		Hard Drive	$38.610	11%	$57.769	13%
		Modem	$70.384	20%	$69.370	16%
		CD-ROM Drive	$62.900	17%	$81.104	19%
		TOTAL	$195,127	54%	$230,199	53%
	Professional Series	Mouse	$12.516	3%	$9.748	2%
		Modem	$55.905	15%	$41.707	10%
		Hard Drive	$39.647	11%	$77.886	18%
		CD-ROM Drive	$57.723	16%	$71.129	17%
		TOTAL	$165,791	46%	$200,470	47%
GRAND TOTAL			$360,918	100%	$430,669	100%

Brio's query tool allows users to query against data

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EVALUATORS

AGRICULTURAL COMPANY

Client platform	Macintosh, Windows, Windows NT
Database	System 10, Oracle7
Server platform	HP-UX
End-user applications	Microsoft's Access, Excel, Visual Basic applications
Why Intersolv?	Macintosh support

EDUCATION

Client platform	Macintosh, Windows, Windows for Workgroups
Database	System 10, dBase, FoxPro, Microsoft's SQL Server
Server platform	Microsoft's NT Server
End-user applications	Access, Excel
Why Intersolv?	Macintosh support

OIL AND GAS COMPANY

Client platform	Macintosh, Windows
Database	System 10
Server platform	IBM AIX
End-user applications	Excel
Why Intersolv?	Macintosh support

SOFTWARE DEVELOPER

Client platform	Windows, Unix
Database	Oracle7, System 10
Server platform	Unix
End-user applications	Custom application
Why Intersolv?	Supported the most DBMSs

Visigenic's
ODBC DriverSet

Visigenic Software, Inc., San Mateo, Calif.
☎ *(415) 286-1900*

SUPPORTED DATABASES

Informix, Sybase's System 10, Ingres, Microsoft's SQL Server, Oracle7

EVALUATORS

SOFTWARE DEVELOPER 1

Client platform	Windows
Database	Oracle7, System 10, Informix, Ingres
Server platform	NA
End-user applications	Muskrat (database access server for Web page development)
Why Visigenic?	Most responsive to our requests

SOFTWARE DEVELOPER 2

Client platform	Windows, Unix, Novell
Database	Several SQL databases
Server platform	Unix
End-user applications	Business Basic (language)
Why Visigenic?	Strong Unix support

SOFTWARE DEVELOPER 3

Client platform	Macintosh, Windows
Database	Oracle7, Ingres
Server platform	Unix
End-user applications	Custom applications
Why Visigenic?	Needed its ODBC Test Suites for checking specification conformity

MANUFACTURING COMPANY

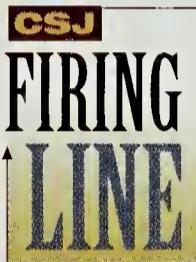|	
Client platform	Windows, Unix
Database	Microsoft's SQL Server
Server platform	Windows NT
End-user applications	Custom applications
Why Visigenic?	Liked development kit

The Client/Server Journal Firing Line is an evaluation based on interviews with eight major users at corporate installations. The products under review are being used in a test environment.

Not All ODBC Drivers Were Created Equal

BUT DIFFERENCES BETWEEN INTERSOLV'S AND VISIGENIC'S DRIVERS REMAIN SUBTLE IN ISSUES SUCH AS INSTALLATION, PERFORMANCE

CSJ FIRING LINE

How do developers choose the right ODBC drivers? After all, the very existence of ODBC standards means drivers from one vendor are nearly identical to those from another, so the decision is less complicated than choosing the database the driver will access. But likeness can make the choice confusing, especially for application builders who don't fathom the subtle differences.

Open Database Connectivity (ODBC) is a database-independent application programming interface (API) from Microsoft Corp. The API enables ODBC-compliant applications to access data in a variety of heterogeneous database servers. This means developers no longer have to learn proprietary APIs or customize their applications to specific databases.

Platforms and database management systems supported are the two most obvious areas in which ODBC drivers differ. Less obvious, however, are the differences among installation programs, data retrieval performance and development kits. The way vendors address these issues is completely independent of the standards that keep the APIs identical.

"It's sending all kinds of random messages back, and Intersolv has not yet sent a fix."

What started out looking like a compatibility problem for William Yuan, president of Globalink Technologies, Inc., a software development company in San Jose, Calif., was actually an installation glitch. Yuan was using Visigenic's driver for Oracle7.

"There is a key piece of information we needed to put in during the installation, but it wasn't mentioned in the documentation," he said.

INSTALLATION

Intersolv	**A B C C**
Visigenic	**B A A C**

Yuan's installation frustration was something of an exception, but other users did report minor glitches and pet peeves. For instance, Macintosh users said they were not happy with the Intersolv installation technique. Currently, users must install the drivers by dragging files from one folder to another.

"Most of our [in-house] support calls are from users who mess up the [Macintosh]

This evaluation looks at the ODBC drivers from two leading vendors: Intersolv, Inc. in Rockville, Md., and Visigenic Software, Inc. in San Mateo, Calif. In-depth interviews were completed with eight users — four from each driver set — on the areas where the drivers differ most. The grades represent the user's satisfaction with the driver's or vendor's performance.

COMPATIBILITY

Intersolv	**C A B B**
Visigenic	**B B C B**

The platforms and DBMSs a driver set supports have more influence over a company's

buying decision than any other factor, according to users. It is the one area where the drivers most noticeably differ.

Platform compatibility never presented a problem to users of either driver set. All four Intersolv evaluators needed Windows support but chose Intersolv's DataDirect Drivers for Macintosh support.

"They had proven Macintosh support first," said John Donahue, senior programmer at Netel Educational Systems, a development company in Lavern, Calif. On Windows, the Macintosh and Unix, both driver sets worked flawlessly, evaluators said.

DBMS compatibility is a lit-

tle trickier. Although the API is the same, each DBMS still requires a driver written specifically for it. Consequently, the driver written for, say, Informix may work great, but the one for Oracle may not, even though the two came in the same driver set.

Each evaluator interviewed was accessing several different DBMSs on various platforms. And although each driver worked as expected, users experienced trip-ups.

"We're having problems with Intersolv's Sybase driver talking to [Microsoft's] Access," said Stephen Kerns, senior technical analyst at Cargill, Inc. in Wayzata, Minn.

Each of the four evaluators (see chart for list) graded the ODBC drivers on a five-letter scale. When evaluators could not comment, (-) replaces their grade.

Excellent	**A**
Good	**B**
Fair	**C**
Poor	**D**
Very Poor	**E**

installation," Donahue said. "It needs a program that would install and configure the drivers, like on its Windows product."

Donahue also said Intersolv needs a program to facilitate driver installation to a number of users on a variety of workstations in a networked environment.

"I was really disappointed," he said. "This ability should be in [Intersolv's] Developer's Toolkit."

PERFORMANCE

Intersolv	C B B C		
Visigenic	B - - B		

By their very nature, ODBC drivers are slower than direct drivers, which accounts for the low performance scores. But in truth, users choose ODBC for its openness, not its speed.

Two of the Visigenic evaluators had not compared its DriverSet drivers with other ODBC drivers. Both are still in the development phase, testing the driver's reaction to simple and complex queries, and are therefore unable to comment on performance in real-world situations.

Intersolv users said the drivers were slower than Microsoft's ODBC drivers. The reason: Intersolv's default writes the result set to the client's disk. This slows the query down but expedites subsequent queries on the same information.

"It's so you're not incurring network overhead by querying the database again," Donahue said.

After tuning the query's behavior, users found that execution was just as fast, if not faster. However, this kind of tweaking is not for the timid. "You have to manually tweak text files," he said.

DEVELOPMENT KITS

Intersolv	B B A B		
Visigenic	B A B A		

Both vendors offer their own development kits for building ODBC-compliant C and C++ database applications. The interface and library calls of both development kits are nearly identical because of the ODBC standard. Where the kits differ is in their packaging

and installation.

Visigenic users praised the packaging of its software development kits.

"We started with Microsoft's development kit, which I thought was very tedious," said John Schroeder, engineering services manager at Basis International Ltd., a database development company in Albuquerque, N.M.

Schroeder said he spent a great deal of time searching for the ODBC portion on Microsoft's development CD. But "Visigenic's was very specific. I didn't have to hunt around for anything because it was all packaged separately on a couple of disks," he said.

Intersolv users also said they liked the packaging of the developer's tool kit but complained that Intersolv has been slow to update the kit for the new Version 2.0-compliant drivers. "They gave us the new drivers a while ago, but we can't take advantage of the new functionality because they haven't updated the library calls," Donahue said.

Intersolv said it expects to have the new calls ready some time this month.

VENDOR SUPPORT, TRAINING

Intersolv	C B A A		
Visigenic	A A B A		

Both Intersolv and Visigenic offer an array of support plans and training sessions to ease users into ODBC. Users of both vendors' products characterized their experiences with the support staffs as helpful and timely.

"I have the direct phone numbers of at least four [Intersolv] support people," said Dan Saathoff, information technology consultant at BP Exploration in Anchorage, Alaska. "They know I'm four time zones away, so they gave me a way to make direct contact," he said.

Evaluators also said the relatively small size of these two vendors makes their support staff more responsive than the large database companies.

"Sometimes we can't wait the full day for Oracle to call us back," Yuan said. "Visigenic's support is close to instantaneous." ◼

Written by Kevin Burden, Computerworld's senior researcher, Firing Line/Scorecard.

Intersolv Responds

MICROSOFT ACCESS
We have been working with Microsoft to resolve the problems its customers are having with third-party ODBC drivers. Intersolv has developed several workarounds with various drivers to overcome most Access-specific ODBC problems. Users should contact Intersolv for more information on these fixes.

MACINTOSH INSTALLATION
Intersolv will include a standard Macintosh install program in its DataDirect ODBC 3.0 version.

NETWORK INSTALLATION
Depending on how the ODBC Pack is copied to the network, drivers can be installed on clients individually, or a client can run a shared version of the product from the network.

Visigenic Responds

ORACLE7 DRIVER
Visigenic is unaware of any problems with its Oracle7 driver or its documentation. To work properly, both the driver and the Oracle Client configuration need to be installed correctly. If the user is missing the Oracle Client Libraries or has a version incompatible with Oracle7, there will be issues.

WINDOWS 95 SUPPORT
Windows 95 drivers [were scheduled to] be shipping in September this year.

MACINTOSH TEST SUITES
Visigenic now has Test Suites for the Macintosh, as well as for OS/2, Windows and several Unix platforms. The Test Suites are sold in source-code form.

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Database Details Made Easier

MODELING TOOLS

VIVID CLARITY 1.1
Intek Technologies, Inc.
Atlanta

WHAT: This second release of Intek's modeling tool for client/server database applications adds support for Microsoft Corp.'s OLE 2.0, new reporting and report-writing functionality and the ability to generate all major types of data windows.

Vivid Clarity enables programmers to create, manipulate and refine visual models of their intended applications before coding begins. Object-oriented in nature, Vivid Clarity represents as "entities" all the items in an enterprise's information universe as well as the relationships between those items and the rules governing their interaction in the database application.

In the database design mode, Vivid Clarity automatically produces the data definition language to create or modify databases, including Sybase, Inc., Oracle Corp. and other Open Database Connectivity-supported databases.

WHERE: The minimum system configuration for Clarity is a 386-based CPU, 4M bytes of RAM (8M bytes recommended), 10M bytes of disk space and Windows 3.1.

WHEN: Available since August.

HOW MUCH: $495.

USER FEEDBACK: Darlene Hancock, vice president for development at CD Group, Inc., an Atlanta firm that designs client/server software, beta-tested the new release of Vivid Clarity and described it as a significant improvement over an already useful client/server development environment.

In particular, Hancock cited the new version's OLE reporting functionality, which allows Vivid Clarity to work smoothly with other OLE tools. "Clarity helps you see and correct problems at the lowest levels of your software design that you'd never have seen without it," she said.

PHONE: (800) 654-3249
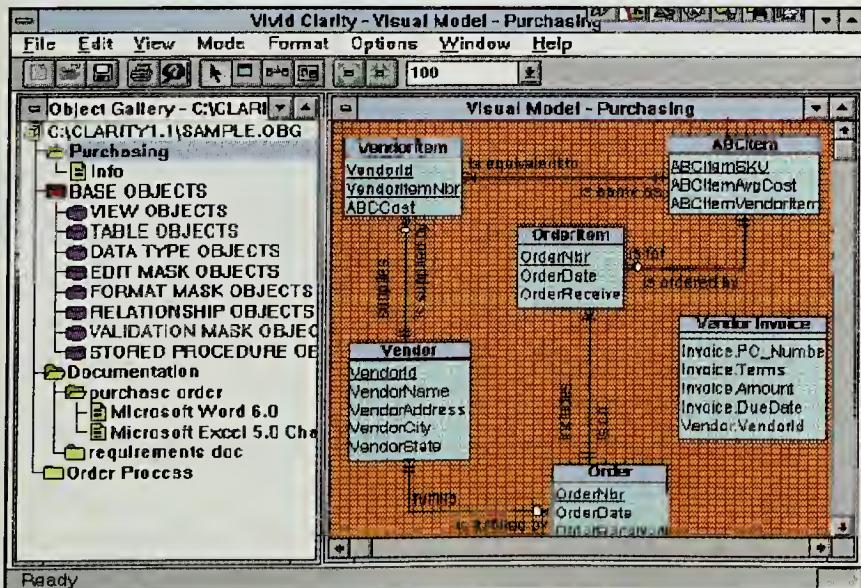
Vivid Clarity 1.1 can generate all major types of data windows

SQL ASSISTANCE

SP_ASSIST
Sheridan Software
Systems, Inc.
Melville, N.Y.

WHAT: Sheridan Software's sp_Assist is a multiuser development environment that aids application developers in creating, coding and managing SQL stored procedures and all other SQL objects, such as tables and triggers.

The package generates SQL server and Microsoft Corp.'s Visual Basic code, including INSERT, UPDATE, SELECT and DELETE, stored procedures or queries, as well as the Visual Basic code, type definitions and constants needed to call them.

In addition, sp_Assist Project Files store all of the developer's SQL server source code in an indexed multiuser database that's separate from the SQL server, which allows multiple server development. The software package also controls access and editing of SQL source code and tracks changes made to the source code.

WHERE: Visual Basic; most popular SQL servers.

WHEN: Available since August.

HOW MUCH: $595.

USER FEEDBACK: Bharat Kumta, project manager in the global assets technology group at Bankers Trust Co. in New York, said sp_Assist has shortened the learning curve for programmers newly entering the client/server world of application development. "There's many client programmers who don't have the back-end SQL server expertise," he said. "By providing a tool like sp_Assist, we can make it much more productive for developers.

"sp_Assist is very user-friendly and intuitive to use," Kumta noted.

The product's database administration tools, geared especially to the needs of developers, greatly simplify the management of application development projects that involve not only multiple programmers but also multiple servers.

At Bankers Trust, for example, SQL application code resides in three different types of server environments, according to Kumta: development, test and production. In the past, programmers had to update code separately in each environment — a time-consuming duplication of effort. "But this one tool can control all three environments," Kumta said. Users need only tell sp_Assist which environment they're interested in.

Although sp_Assist stores all information in one place, it will give you information about the application based on which back-end server the programmer is connected to, such as for which environments a given procedure has already been compiled, Kumta said.

PHONE: (516) 753-0985

ANALYTICAL SOFTWARE

LOG ANALYZER
Platinum Technology, Inc.
Oakbrook Terrace, Ill.

WHAT: A transaction log analyzer for the client/server world, Log Analyzer can access the transaction files in Sybase, Inc. and Microsoft Corp.'s SQL Server to easily recover lost data, reconstruct past database events, tune application performance and audit database activity. With Log Analyzer, administrators can directly examine the contents of SQL syslogs.

SQL database administrators can use Log Analyzer to identify event sequences, excessive index modifications, deadlocks and poorly written transactions. The tool will also regenerate DML statements from the log to reverse erroneous deletes, inserts and updates and is capable of creating audit reports without affecting system performance.

WHERE: Runs on PC and Unix platforms, compatible with Microsoft's Windows 3.1 or Windows NT. Also runs on Sun Microsystems, Inc.'s Solaris and SunOS, Hewlett-Packard Co.'s HP-UX and IBM's AIX running X Window System. Supports Sybase's SQL Server Version 4.2 and higher and Microsoft's SQL Server Version 4.2 and higher.
WHEN: Shipping now.
HOW MUCH: The Windows version costs $995. The Sun Motif version is priced at $1,895.
USER FEEDBACK: Tu Le, database administrator at Citation Insurance Co. in San Jose, Calif., used Log Analyzer to tune the primary database application at the workers' compensation insurance firm. "When Log Analyzer gave me a look at the syslog, I discovered that our front-end tool was creating a very ineffective query." Once the query problem was identified, he said, it was a simple matter to fix and the improvement was significant.

The open nature of SQL Server applications makes audit trails more important yet more difficult to create, Le pointed out. "The typical situation in our organization is that we'll find a policy has been changed, but it isn't always clear who made the change," he said. "We can use the Log Analyzer to see in detail who has made what changes in the database."
PHONE: (800) 442-6861
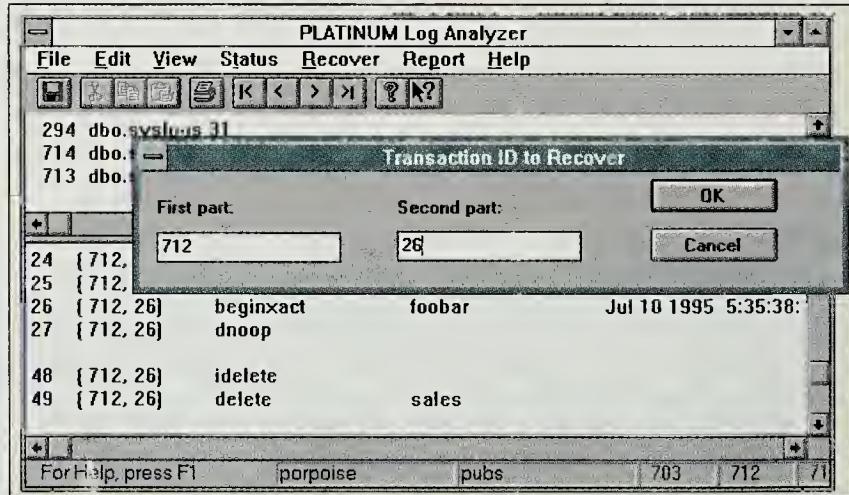
With **Log Analyzer**, administrators can directly examine syslogs

MIDDLEWARE

OMNICONNECT RELEASE 10.5
MDI, (a Sybase, Inc. company)
Boulder, Colo.

WHAT: Positioned as a critical link in the SQL interoperability puzzle, this second generation of Sybase's Enterprise Connect product set provides organizations with a single comprehensive tool for enterprise data access, copy management, interoperability management and data warehousing.

OmniConnect enables organizations to connect different databases, which allows users to gain a complete view of their data sources without needing to know which physical server or what application format the data resides in.

OmniConnect uses access modules or gateways to join the disparate data stores. With its OmniSQL Access modules, OmniConnect can provide transparent read and write access through a single application programming interface to 21 different data sources, including Oracle, Informix, DB2, CA-Ingres, Rdb, IMS, IDMS, VSAM and Adabas.

Support for Sybase's SQL Server and RMS is built into OmniConnect.
WHERE: Complete Sybase System 10 compatibility.
WHEN: Shipping since August.
HOW MUCH: $2,200 to $99,500. Pricing depends on the platforms involved and on the total number of users. Existing customers of the previous version of OmniConnect receive a free upgrade.

USER FEEDBACK: Ty Moser, data engineer at Indianapolis-based Boerhinger Mannhein Corp., has run a beta program using the new version of OmniConnect as a key component in restructuring the information environment at the international health products provider.

"The main thing OmniConnect does is allow us to distribute the remote servers into functional areas through one single point," he said. "This way we can partition data that belongs to different parts of the company and put functional areas into their own servers. Then we can fine-tune each individual area, depending on its particular needs."

Since we can isolate the servers, if we have problems with one SQL server, it won't negatively affect other areas of the company. But users will not be aware of the differences between the physical SQL servers, so what users actually see is that their data all appears to be in one place," Moser explained.

Moser described the new version as a marked improvement over the previous generation. "Compared with the first release, we found it had very good response," he said. "Our main criteria for the new OmniConnect product was that we wouldn't have to rewrite any SQL code," he said. "The new product has been 100% compatible and has allowed us to use all our existing SQL code."
PHONE: (800) 619-1234

Written by Paul Karon, a freelance writer based in Los Angeles.

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COMPANIES IN THIS ISSUE

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The Back Page

"We pulled from several outside services to build our c/s architecture - Microsoft, Andersen Consulting, the U.N. peacekeeping forces..."

Conferences

■ **FUNDAMENTALS OF CLIENT/ SERVER COMPUTING**
Washington, Oct. 25-27
Contact: Data-Tech Institute, Clifton, N.J. (201) 478-5400 or E-mail www.datatech.com.

■ **TECHNOLOGY FORUM '95**
New York, Oct. 31
Topics include managing client/server growth. Contact: Technology Manager's Forum, New York (212) 787-1122 or E-mail 352-1748@ mcimail.com.

■ **THE INTERNET**
Boston, Nov. 2
Learn to access and use the Internet. Contact: Pryor Resources, Inc., Shawnee Mission, Kan. (800) 255-6139.

■ **ADVANCED INFORMATION MANAGEMENT STRATEGIES**
Coral Gables, Fla., Nov. 8-10
Contact: Meta Group, Stamford, Conn. (203) 973-6700.

■ **WORKSHOPS ON NETWORK SECURITY, FIREWALLS AND INTERNET SERVICES**
Raleigh-Durham, N.C., Nov. 13-15
Contact: Information Warehouse, Inc., Livermore, Calif. (408) 335-9445.

■ **COMDEX/FALL '95**
Las Vegas, Nov. 13-17
New distributed computing conference track features topics such as second-generation client/server tools, E-mail, collaborative computing alternatives and managing distributed systems. Contact: Softbank Comdex, Needham, Mass. (617) 449-6600.

■ **OPEN SYSTEMS WORLD/ FEDUNIX/IT SERVICES '95**
Washington, Nov. 13-17
Contact: Open Systems World, Inc., Columbia, Md. (301) 596-8800.

Network Security Myths
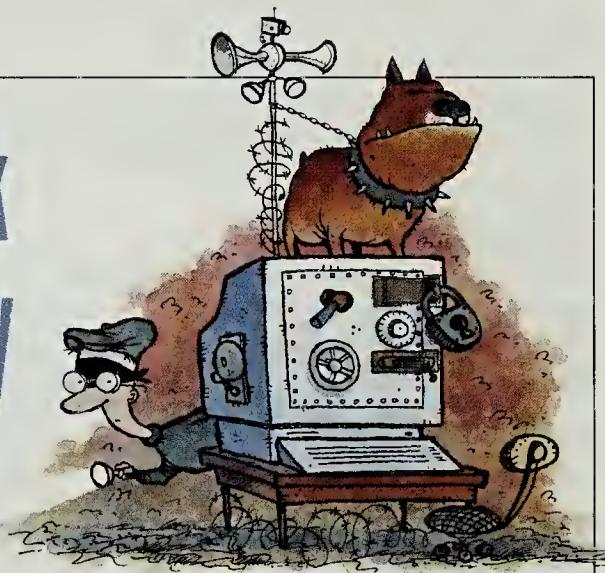
1. Hackers work only at night.
2. Internet security is a computer problem.
3. Risk avoidance is better than risk management.
4. A secure front door to the Internet will secure an organization.
5. Firewalls are good only for public network access, like the Internet.
6. Users generate secure passwords.
7. Until a company makes an official corporate commitment to the Internet, it doesn't need to worry.
8. Hackers always use their own machines to launch attacks.
9. Adding user accounts on a firewall system is not a security concern.
10. Espionage is a concern only for the government and large corporations.

Source: Sterling Software, Inc.

Book Reviews

The following are new titles on the client/server scene:
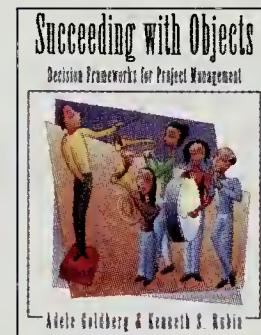
■ **Succeeding with Objects: Decision Frameworks for Project Management,** *Adele Goldberg and Kenneth S. Rubin*; 542 pages; $45.95; ISBN: 0-201-62878-3. Addison-Wesley Publishing Co. (617) 944-3700.

■ **Client/Server Computing for Technical Professionals,** *Johnson M. Hart and Barry Rosenberg*; 352 pages; $34.38; ISBN: 0-201-63388-4. Addison-Wesley Publishing Co. (617) 944-3700.

■ **Data Warehousing and Decision Support: The State of the Art;** 200 pages; $44.95; ISBN: 1-57109-005-3. Spiral Books (603) 647-2344.

■ **Exploring the PowerPC Revolution,** *Jim Hoskins and Jack Blackledge*; 144 pages; $22.95; ISBN: 1-885068-02-6. Maximum Press (904) 934-0819.

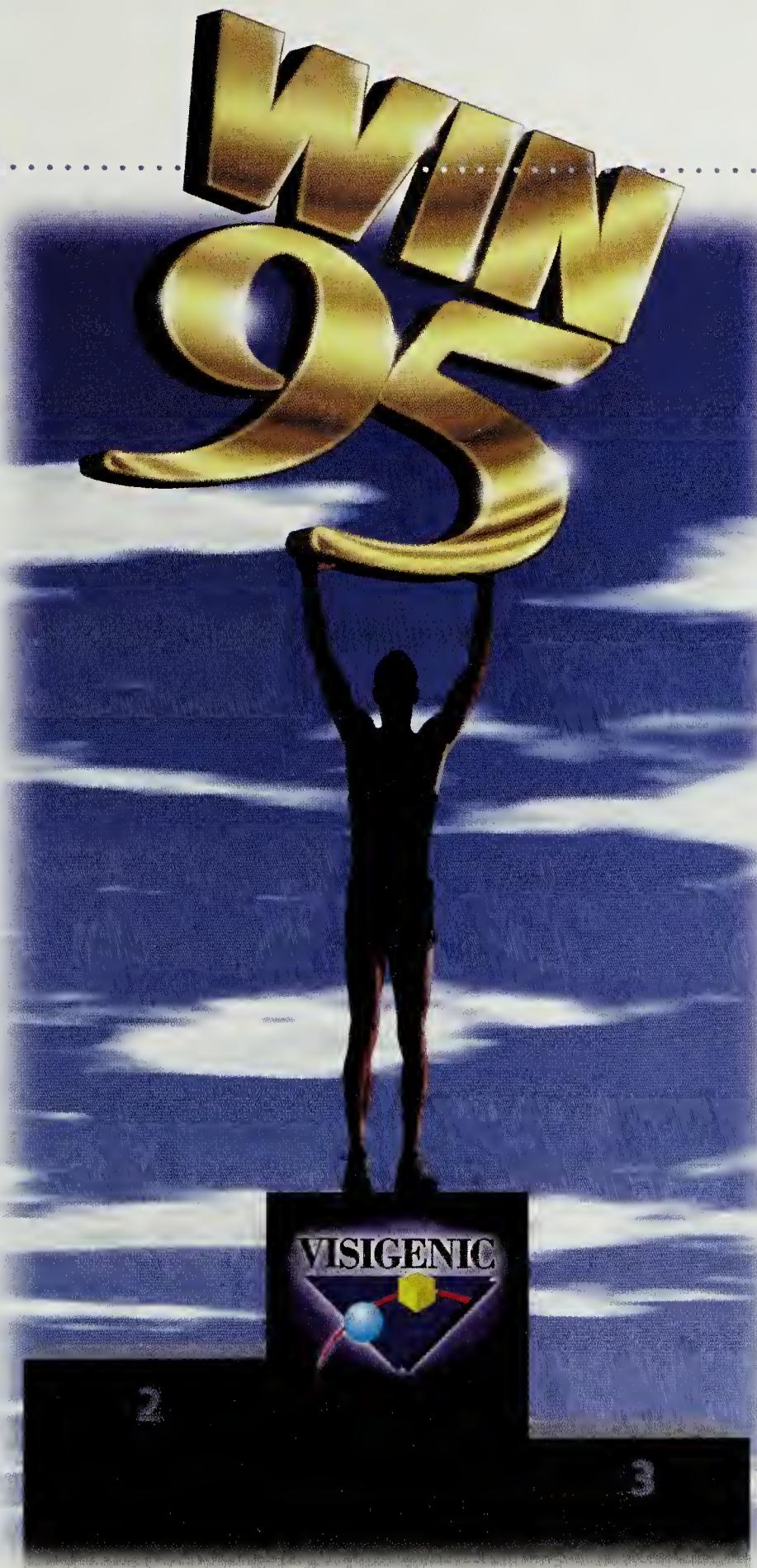# PATROL: Bringing harmony to complex environments

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